TOUGHBOOK Arbitrator
mobile digital video system

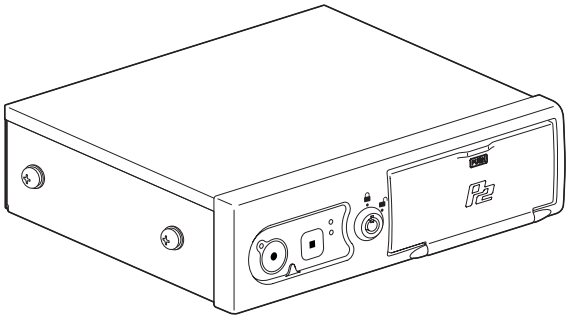
Panasonic

Operating Instructions

Memory Card Video Recorder

Model No. AG-CPD15P

Car Use only



Toughbook Arbitrator

Before operating this product, please read the instructions carefully and save this manual for future use.

S0806K8088 -M
Printed in Japan

ENGLISH
VQT1A18-7

Read this first!

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING:

- **TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.**
- **TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD, KEEP THIS EQUIPMENT AWAY FROM ALL LIQUIDS. USE AND STORE ONLY IN LOCATIONS WHICH ARE NOT EXPOSED TO THE RISK OF DRIPPING OR SPLASHING LIQUIDS, AND DO NOT PLACE ANY LIQUID CONTAINERS ON TOP OF THE EQUIPMENT.**

CAUTION:

TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD AND ANNOYING INTERFERENCE, USE THE RECOMMENDED ACCESSORIES ONLY.

▭ indicates safety information.

CAUTION:

In order to maintain adequate ventilation, do not install or place this unit in a book case, built-in cabinet or any other confined space.
To prevent risk of electric shock or fire hazard due to overheating, ensure that curtains and any other materials do not obstruct the ventilation.

FCC Note:
This equipment has been tested and found to comply with the limits for a class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
Warning: To assure continued FCC emission limit compliance, the user must only use shielded interface cables when connecting to external units. Also, any unauthorized changes or modifications to this equipment could void the user's authority to operate it.

- This recorder is designed for use and installation in a vehicle.
  For example, it may be mounted on the center console or in the trunk.
- The installation of this equipment must only be performed by a professional installer.

CAUTION:

To reduce the risk of fire, the red (BATT) and white (SIGNAL) wires of the power cable must be connected via fuses (5 A) having UL Listing.

▭ indicates safety information.

IMPORTANT SAFETY INSTRUCTIONS

(1) Read these instructions.

(2) Keep these instructions.

(3) Heed all warnings.

(4) Follow all instructions.

(5) Do not use this equipment near water.

(6) Clean only with a dry cloth.

(7) Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.

(8) Do not install near any heat sources such as radiators, heat registers, stoves, or any other equipment (including amplifiers) that produce heat.

(9) Only use attachments/accessories specified by the manufacturer, and as outlined in this manual.

(10) Refer all servicing requests to qualified service personnel. Servicing is required when the equipment has been damaged in any way, such as damage to the power supply cord or plug, liquid being spilled on or objects have fallen into the equipment, the equipment has been exposed to rain or moisture and does not operate normally, or has been dropped.

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Information on software for this product

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  To obtain the source codes, go to the following home page.
  https://eww.pavc.panasonic.co.jp/pro-av/
  The manufacturer asks users to refrain from directing inquiries concerning the source codes they have obtained and other details to its representatives.
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  https://eww.pavc.panasonic.co.jp/pro-av/
- This product is licensed under the MPEG-4 Visual patent portfolio license for the personal and noncommercial use of a consumer for (i) encoding video in compliance with the MPEG-4 Visual Standard ("MPEG-4 Video") and/or (ii) decoding MPEG-4 Video that was encoded by a consumer engaged in a personal and non-commercial activity and/or was obtained from a video provider licensed by MPEG LA to provide MPEG-4 Video. No license is granted or shall be implied for any other use. Additional information including that relating to promotional, internal and commercial uses and licensing may be obtained from MPEG LA, LLC.
  See http://www.mpegla.com/

Features

■Record video on memory cards

Video and audio files can be recorded on memory cards with the “P2” logo (such as the separately sold AJ-P2C016RG afterwards called P2 cards), in MPEG4 and G.726 formats.

■Record a variety of information

In addition to video and audio files, meta information including recording date and time and recording triggers can be recorded.

■Long-term recording

A maximum of 1168 hours (48.6 days) of recording is possible (in intermittent recording mode using two 32 GB P2 cards and a recording bit rate of 512 kbps).

Included Accessories

Key 1

Mounting bracket
(attached to the recorder).....2

Options

■P2 card
16 GB (AJ-P2C016RG)
32 GB (AJ-P2C032RG)

■Remote Control Panel
(AG-RCP30P)

■Color Camera (AG-CK10P)

■Cable Kit (AG-CR12P)

About This Manual

This manual is organized as described below and uses the following conventions in presenting how to operate the Remote Control Panel (separately sold).

■Definition of terms

Officer : anybody using the Remote Control Panel.

Administrator :
a user with administration privileges to collect and manage Memory Card Video Recorder data.

■"Operation Using the Remote Control Panel (separately sold)"

These sections describe operations available to officers.

■"Administrator Operations on the Remote Control Panel (separately sold)"

These sections describe operations available only to administrators.

Major contents

- How to change the factory defaults as required by the operating environment.
- How to collect and keep the recorded data.

■"Menu Screen of the Remote Control Panel (separately sold)"

This section lists the functions provided by the operation menu displayed on the LCD panel of the Remote Control Panel.

■Organization of the "Operation Using the Remote Control Panel (separately sold)" sections

This manual uses the following symbols to distinguish between operations that involve button operations and those that use LCD panel menus.

Example)
Button operations of the Remote Control Panel are indicated as follows :

◎Selecting a camera

While menu operations are indicated as follows :

Adjusting image brightness

Before Use

■Always take a trial shoot.

Before making important recordings, always take a trial shoot to confirm that recording works as expected. Especially when using “Backlighting Compensation” or “Night Shooting with the IR Function”, verify that your settings produce the desired results.

■When using for the first time or when using in a place with a different time zone, set the correct time zone.

The factory default time zone setting is “Eastern Standard Daylight Saving Time”.
When using in a different time zone, set the time zone for that region.
(see “TimeZone” on page 79)

■Recording officer data on this unit allows you to find out the person performed recording later.

(see “Setting up/Deleting Officer Data” on pages 52, 53)

■Use together with the Remote Control Panel and other specified, separately sold accessories.

■This unit can be controlled by application software running on a Remote Control Panel or a PC (referred to as PC application in this manual).

- For details on how to run the PC application, see the Operating Instructions of the PC application.
- Connecting a personal computer (referred to as PC in this manual) to this unit and starting up application software (referred to as PC application in this manual) on the PC freezes this unit in the live screen and disables the following operations.
  - Setting up/Deleting Officer Data
  - A trial shoot
  - Playback
  - Restoring Files
  - Administrator Setup

■Usable memory cards

The recorder is designed to use any P2 card having the “P2” logo.

■Do not turn the power off while recording.

Be sure to stop all operations before turning the power off (see “Stopping Recording” on page 22).
Turning the power off especially during access (for example, during recording) may damage the P2 card or corrupt file management data, setting information and other data on the P2 card. If file data cannot be read correctly due to corrupted file management information on the P2 card, the card should be reformatted. For details on reformatting, refer to “Format” on page 86 or contact your supplier.

- In no event will Panasonic be liable for any damages, including any incidental or consequential damages, stemming from a failure to record data or from lost settings or data.

  Any of the following actions can result in problems:
  - Power supply to the recorder is interrupted or impaired during recording, for example by starting an engine.
  - If a P2 card is ejected while it is being accessed (for example during recording).

Notes on Handling

■Usage

- Do not remove a P2 card while it is being accessed, as the P2 card may be damaged or the P2 card slot may become disabled. When the recorder senses a disabled slot, it may reboot itself automatically.
- Do not set liquid containers or small metal objects on the recorder or P2 cards.
- Do not insert foreign objects into the openings of any devices.
- Do not attempt to modify the recorder or P2 cards.
- Do not use the recorder in a place where it or a P2 card might get wet, or water might get inside them.
- The recorder is intended to work only with P2 cards. Do not attempt to use non-P2 cards, as that could damage the recorder.
- When inserting a P2 card, make certain that it is not upside down or backwards, and do not attempt to force a bent or damaged P2 card, as that could damage the card or P2 card slot.
- While the recorder is operating (and especially recording), do not disconnect the recorder's power cable (included in the separately sold Cable Kit). Before disconnecting the power cable, first stop all operations and turn the recorder off. Otherwise, the P2 card may be damaged, or recorder setting files or management data on the P2 card may be corrupted.

Precautions for use of P2 cards (16 GB or higher capacity)

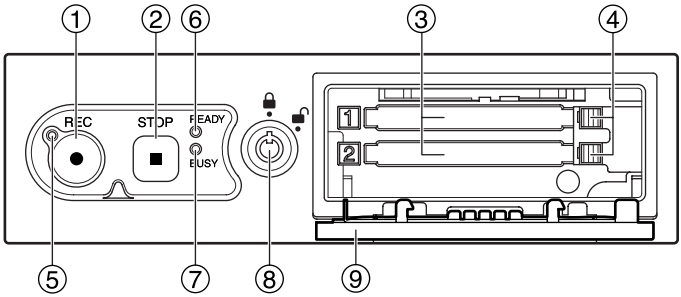
- Use this unit to format new P2 cards. (see "Format" on page 86)
- A P2 card formatted in this unit contains the folders required for the Memory Card Video Recorder operation. Do not modify (delete, copy, move, etc.) these folders on a PC.
- A P2 card whose folders have been modified on a PC must be reformatted in this unit.
- Since the number of recording days and files on a P2 card is limited, exceeding the maximum number of recording days and files will detect an end of card event even if there is space left on the card.

■Maintenance

- To clean the recorder, turn the vehicle's ignition switch to the LOCK (OFF) position, and keep the recorder power turned off (see "Off" on page 19).
- Do not use solvents such as benzene, thinner or alcohol, as these can deform the case or damage the surface finish.
- Use a soft, dry cloth to dust off the recorder. If severely soiled, wipe it with a cloth moistened with a weak solution of mild synthetic detergent and wrung out, and afterwards wipe with a dry cloth.
- If using a chemically treated cloth, follow the instructions provided with it.

Control Reference Guide

Front panel



① REC button (●)
Starts recording of video and sound to a P2 card.

② STOP button (■)
Stops recording.

③ P2 card slots 1, 2
Insert P2 cards here. Up to two cards can be inserted simultaneously.

④ Eject button
Serves to eject a P2 card.

⑤ REC lamp
Lights up during recording. If the combined remaining recording time for the cards inserted in the P2 card slots 1 and 2 is less than 30 minutes, the lamp starts to flash (see “Indicator Lamps and Recorder Status” on page 110).

⑥ READY lamp
Lights up when recording is possible on a P2 card inserted in a P2 card slot (see “Indicator Lamps and Recorder Status” on page 110).

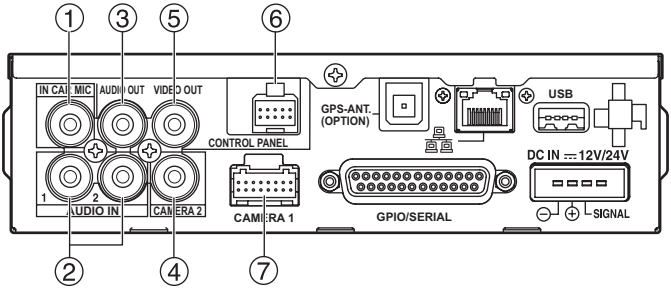
⑦ BUSY lamp
Lights up or flashes while a P2 card is accessed (recording or playback; see “Indicator Lamps and Recorder Status” on page 110).

⑧ Lock
Locks and unlocks the P2 card slot cover.

⑨ P2 card slot cover
Protects the P2 cards.
Recording is disabled when open.

Control Reference Guide (continued)

Rear panel (1)



① IN CAR MIC connector (Pin jack)
This is a mic level signal input.

② AUDIO IN 1, 2 connectors (Pin jack)
These are line level signal inputs.
The output signals of audio components can be connected here.

③ AUDIO OUT connector (Pin jack)
This is a line level signal output.
Accepts connection of the cable attached to the separately sold Remote Control Panel.

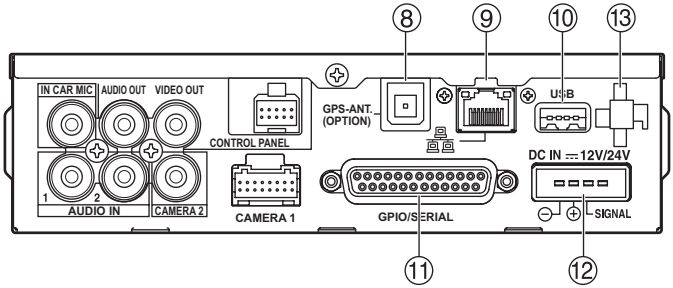
④ CAMERA2 connector (Pin jack)
This is a composite signal input.
Connect a commercially available camera.

⑤ VIDEO OUT connector (Pin jack)
This is a composite signal output.
Provides output of the video applied to the [CAMERA1] or [CAMERA2] connector.
Accepts connection of the cable attached to the separately sold Remote Control Panel.

⑥ CONTROL PANEL connector
Connect the separately sold Remote Control Panel using the cable attached to the Remote Control Panel.

⑦ CAMERA1 connector
Connect the separately sold Color Camera using the cable attached to the Camera.

Rear panel (2)



⑧ GPS-ANT. (OPTION) connector

Insert the cable from the GPS antenna (included in the separately sold Cable Kit). During GPS reception, the signals received will regularly and automatically set the recorder clock to GPS time.

⑨ LAN connector

Connect the recorder to a PC using a commercially available LAN cable (cross cable).

Note:

For details on how to connect a PC, contact your supplier.

⑩ USB connector

A commercially available USB memory device can be connected for use as external memory.

Not all USB memory devices may be recognized.

Notes:

- To protect the [USB] port, connect the USB extension cable (included in the separately sold Cable Kit) to the recorder before connecting a commercially available USB memory device.
- A maximum of two USB memory devices can be connected when using a commercially available USB hub.
- Consult your supplier for help with connection.

⑪ GPIO/SERIAL connector

This combo connector accepts up to eight trigger signal (GPIO1-8) inputs, provides one recording status output to GPIO9 and also serves as a serial port. Connect the trigger cable here (included in the separately sold Cable Kit).

⑫ DC IN connector (DC IN ⎓ 12V/24V)

This connector accepts power from the vehicle battery.

Connect the power cable here (included in the separately sold Cable Kit).

Note:

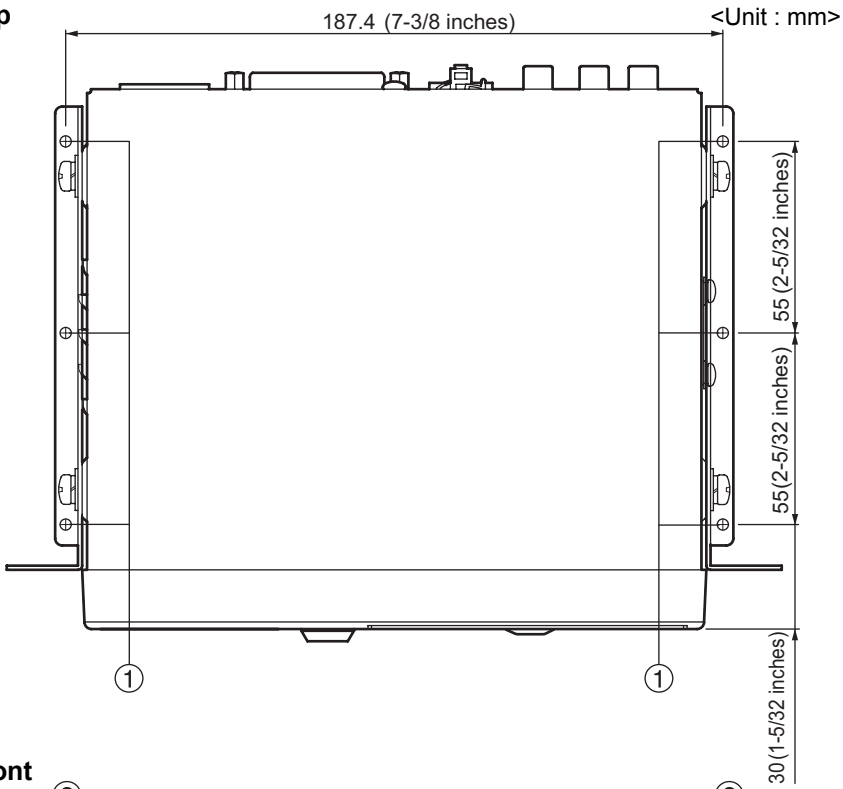
Do not pull out the power cable while the recorder is running. Turning the power off especially during access (for example, during recording) may damage the P2 card or corrupt file management data, setting information and other data on the P2 card.

⑬ Cable Clamp

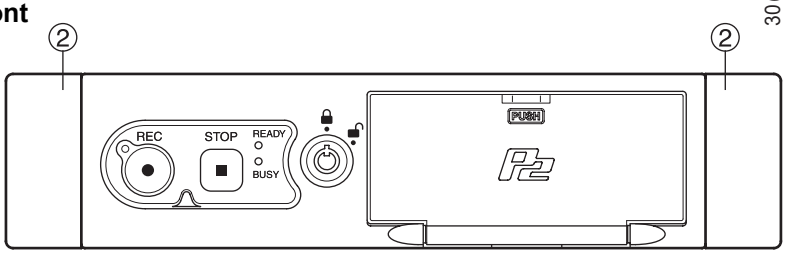
Use this clamp to affix video, audio, camera cables and the power and USB extension cables included in the separately sold Cable Kit.

Mounting bracket

Top



Front



① **Trunk mounting holes (ø3.2)**
These holes are used to mount the recorder in the trunk. Consult your supplier and request help with installation.

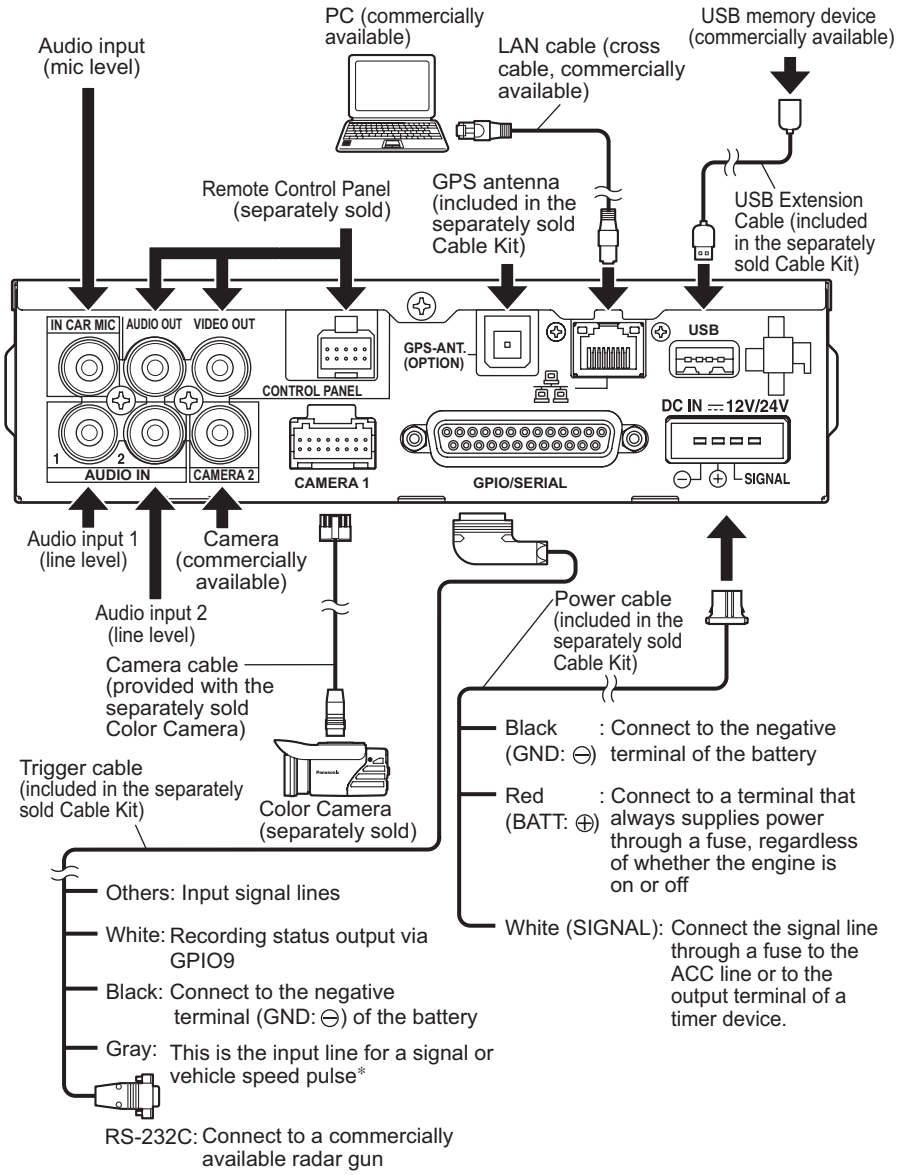
② **Spaces for center console mounting holes**
In these spaces the holes can be made to mount the recorder on the center console.
Consult your supplier and request help with installation.

Connections

- Be sure to consult your supplier and request installation and connection.
- Connect the red (BATT) and white (SIGNAL) wires of the power cable via a fuse (5 A).
  (The power cable is included in the separately sold Cable Kit.)
- Connect the power cable from the passenger compartment fuse box. Use a commercially available automotive cable to provide power from the engine compartment to operate the recorder in the passenger compartment.

- Connect the power cable when all connections are completed. Be sure to read the instructions in the connector diagram on page 103 and the operating instructions of the devices that will be connected.
- Verify that recording is not in progress prior to disconnecting any cables from the recorder.
  Be sure to disconnect the power cable first, and then disconnect any other cables.
- An incorrectly connected power cable could cause a fire or damage. Be sure to connect the power cable correctly.

Connections (continued)


Audio input (mic level)
PC (commercially available)
LAN cable (cross cable, commercially available)
USB memory device (commercially available)
Remote Control Panel (separately sold)
GPS antenna (included in the separately sold Cable Kit)
USB Extension Cable (included in the separately sold Cable Kit)
IN CAR MIC
AUDIO OUT
VIDEO OUT
CONTROL PANEL
GPS-ANT. (OPTION)
USB
DC IN 12V/24V
AUDIO IN
CAMERA 2
CAMERA 1
GPIO/SERIAL
SIGNAL
Audio input 1 (line level)
Camera (commercially available)
Audio input 2 (line level)
Camera cable (provided with the separately sold Color Camera)
Power cable (included in the separately sold Cable Kit)
Trigger cable (included in the separately sold Cable Kit)
Color Camera (separately sold)
Black (GND: ⊖) : Connect to the negative terminal of the battery
Red (BATT: ⊕) : Connect to a terminal that always supplies power through a fuse, regardless of whether the engine is on or off
White (SIGNAL): Connect the signal line through a fuse to the ACC line or to the output terminal of a timer device.
Others: Input signal lines
White: Recording status output via GPIO9
Black: Connect to the negative terminal (GND: ⊖) of the battery
Gray: This is the input line for a signal or vehicle speed pulse*
RS-232C: Connect to a commercially available radar gun

* There are two types of vehicle speed pulse signals: digital waveforms (square waves) and analog waveforms (AC waveforms). The recorder accepts only digital waveforms. Ask your supplier about the connection procedure.

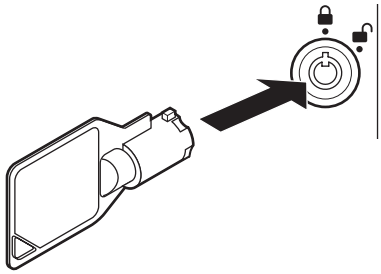
P2 card Insertion and Removal

Do not insert or remove a P2 card when another P2 card is being accessed (while the [BUSY] lamp is lit or blinking). Otherwise the P2 card may be damaged or P2 card data may be corrupted.

Inserting a P2 card

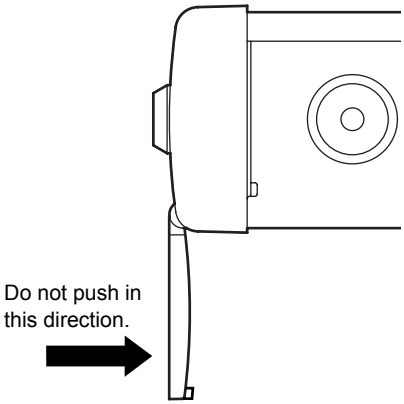
(1) Open the P2 card slot cover.

Insert the key in the lock and turn it clockwise to [🔓].

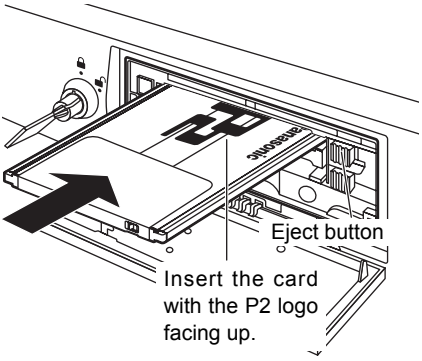


Notes:

- Do not try to turn the key further than the stop position, and do not move it unnecessarily, to prevent damage to the key and lock.
- To prevent damage, do not exert undue force on the open cover.



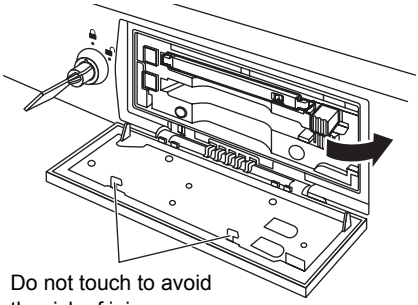
(2) Insert a P2 card into the P2 card slot and push it in until the Eject button pops out.



Note:

The [BUSY] lamp blinks for a few seconds when the P2 card slot cover is opened. Make sure that the blinking has stopped before inserting a P2 card.

(3) Fold the protruding Eject button to the right.



Note:

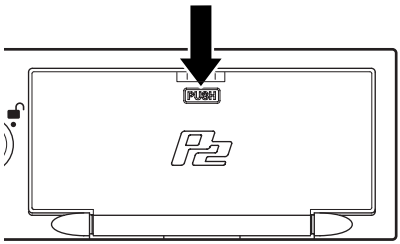
After confirming that the Eject button is folded over to the right, close the P2 card slot cover. Otherwise the Eject button will be damaged.

(Continued on the next page)

P2 card Insertion and Removal (continued)

(4) Close the P2 card slot cover.

Return the P2 card slot cover to its original closed position and press the section marked PUSH.



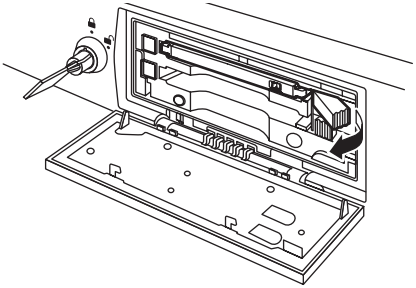
When you close the P2 card slot cover after inserting a P2 card, the [READY] lamp indicates the recorder status (see “Indicator Lamps and Recorder Status” on page 110).

(5) Remove the key.

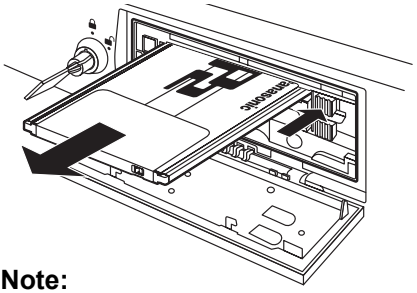
Removing a P2 card

(1) Open the P2 card slot cover (see previous page).

(2) Raise the Eject button.



(3) Push the Eject button so that the P2 card pops out.



Note:

The [BUSY] lamp blinks for a few seconds when the P2 card slot cover is opened. Make sure that the blinking has stopped before removing a P2 card.

Notes:

- If a P2 card was removed while it was being accessed, the files may be corrupted. Refer to “Restoring Files” on page 71 to restore corrupted files.
- If a P2 card was removed while it was being accessed, the P2 card slot may be disabled. When the recorder senses a disabled slot, it may reboot itself automatically.

(4) Close the P2 card slot cover (see top left of this page).

(5) Remove the key.

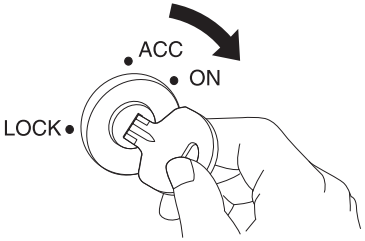
Turning the Recorder On and Off

Recorder power is supplied from the vehicle's battery.

On

Turn the vehicle's ignition switch to ON or ACC.

Power to the recorder is turned on. If the Remote Control Panel is connected, its power is also turned on.



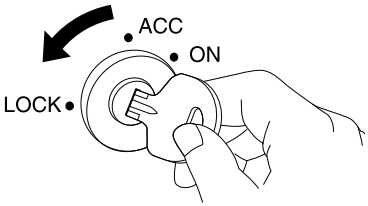
Off

Turn the vehicle's ignition switch to LOCK (OFF).

Power to the recorder is turned off. If the Remote Control Panel is connected, its power is also turned off.

Notes:

- The recorder cannot be turned off from the Remote Control Panel.
- The [PowerOff Time] can be set (see "PowerOff Time" on page 75) to allow the recorder to continue operating for up to 180 minutes after the vehicle's ignition switch is turned to LOCK (OFF).



About the Internal Clock

■Confirming the Time

The internal clock is set at the time of factory default. Check the time before using, and reset the clock if necessary. (see "Date/Time" on page 79)

Note:

To use GPS, connect the GPS antenna (included in the separately sold Cable Kit) to the [GPS-ANT.] connector on the rear panel.
Consult your supplier and request connection.
During GPS reception, the signals received will regularly and automatically set the recorder clock to GPS time.

■Time Zone Setting

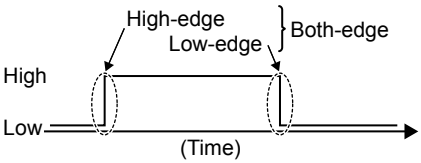
The factory default time zone setting is "Eastern Standard Daylight Saving Time". When using in a different time zone, set the time zone for your region.
(see "TimeZone" on page 79)

About the Trigger Signals

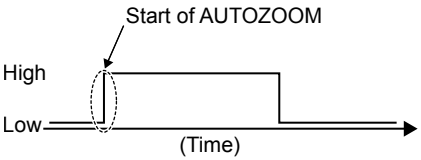
Trigger signals (GPIO1 - 8), which are used for recording control and Color Camera control, consist of edge and level signals.

■Edge signals

High-edge, low-edge and both-edge of an edge signal can be specified. Recording control and Color Camera control start when a change in an edge of the specified signal is detected.



For example, when a high-edge of "AUTOZOOM" is specified (see "Trigger1 to 8" on page 80)**:**

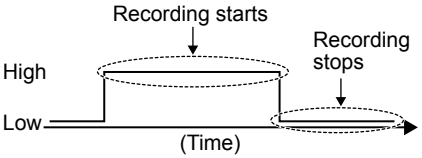


■Level signals

The high-level and low-level of a level signal can be specified and recording control occurs when a change is detected in the specified signal.

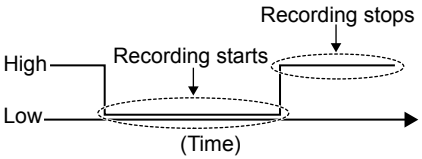
When high-level is specified:

A change in the signal from low to high starts recording and a change from high to low stops it.



When low-level is specified:

A change in the signal from high to low starts recording and a change from low to high stops it.



Starting and Stopping Recording

Recording

■Recording Start Methods

- **Press the [REC] button (the REC buttons on the recorder, Color Camera and Remote Control Panel all operate the same way)**
- **Apply a Recording Trigger**
- **When power-on recording is enabled, recording starts when the recorder is turned on**
- **Programmed Recording (see "Programmed recording" on pages 28, 29)**

The prerecord function (see "Prerecording and postrecording" on pages 24, 25) records video for a pre-specified period prior to a recording-start trigger event (or pressing the [REC] button). The amount of the prerecord time is set from the Remote Control Panel. You can use this function to prerecord video without audio. An audio prerecord time, as well as an audio postrecord time, can be set independently, although it cannot be longer than the specified video prerecord/ postrecord time.

■Recording Triggers

The following types of recording triggers are available.

- When [Action] set for detection of trigger signals (GPIO1 - 8) is "REC", "CAM1REC" or "CAM2REC" and the trigger signal is valid.
- Vehicle Speed Signal
  Speed data detected by the recorder serves as a recording trigger when the specified speed is exceeded. This signal is handled as an edge signal to start recording, and is not used to stop recording.

  Select from the following detection methods according to the intended application or installation conditions.
  Detection of own vehicle speed:
  Uses the vehicle speed pulse (see "Speedpulse" on page 84, "Vehicle Speed Pulse Setting Table (at 40 mph)" on pages 106, 107 and "Vehicle Speed Pulse Setting Table (at 60 kph)" on pages 108, 109) or GPS
  Target vehicle speed:
  Uses a radar gun

Note:

To use the vehicle speed pulse, GPS or radar gun as the recording trigger, check with your supplier to ensure that connections have been made correctly, then specify the source device (see "Radar/GPS" on pages 83, 84, 85).

Notes:

- If both the vehicle speed pulse and GPS are enabled, the vehicle speed pulse has priority as the recording trigger.
  After the recording trigger is detected by vehicle speed pulse or GPS, if the vehicle is stopped or a speed of 5 mph or 5 kph below the set speed is detected, the recording trigger can be used again.
- Recording is allowed only when the [READY] lamp on the recorder is lit. If pressing the [REC] button or applying a recording trigger fails to start recording, the [REC] lamps on the recorder, Color Camera and Remote Control Panel blink at a high rate.
- The Remote Control Panel, the Color Camera and this unit [REC] lamps go on during recording.

(Continued on the next page)

- Video input at the [CAMERA1] or [CAMERA2] connector (see “Setup” on page 34, “Selecting a camera” on page 55 and “Init Camera Select” on page 75) is recorded.
- Audio input at the [AUDIO IN 1,2] or [IN CAR MIC] connectors (see “Setup” on page 34, “Selecting Audio2 input” on page 59 and “Init Audio2 In Select” on page 75) is recorded.
- Recording stops if the P2 card slot cover is opened.
- Recording cannot start unless the P2 card slot cover is closed.
- Recording will not start while the user is configuring administrator settings, even if the level signal satisfies the recording start conditions. In this case, recording will still not start when the user quits the administrator settings. To start recording, the recording start conditions must be satisfied again after configuration of the administrator settings is finished.
- When multiple recording triggers are enabled, recording starts when the first recording start criteria are met, and if a prerecord time has been set, the specified period before the start event is also recorded.
- Recording will not start under the following conditions even if there is space left on a P2 card.
  - When the number of files recorded on the P2 cards inserted in slots 1 and 2 totals over 20,000 files.
  - When the maximum number of recording days on a 16 GB or higher capacity P2 card has been exceeded. (See “Format” on page 86)
  - When, on a single day, the maximum number of files that can be recorded on a 16 GB or higher capacity P2 card has been exceeded. (See “Format” on page 86)
    (However, when the [Rule of Filename] is set to “WT”, recording can be started the next day (the next day according to world standard time) if the maximum number of recording days has not been exceeded. (see “Setup” on page 36 and “Rule of Filename” on page 76)

Stopping Recording

Setting criteria determines when recording stops. Settings that affect when recording stops include the stop timer setting for Rec Continue Time and the presence of the recording trigger level signal.
The following conditions are handled in the same manner.

- When the [STOP] button on the recorder is pressed
- When the [STOP] button on the Remote Control Panel is pressed
- When the [REC] button on the Color Camera is kept pressed for about 2 seconds.
- When [Action] for detection of trigger signals (GPIO1 - 8) is set to “STOP” and the trigger signal has reached an active edge.

■Recording Stop Criteria

Level Signal	Stop Timer Setting	Criteria to Stop Recording (whichever happened earlier)
No	No	[STOP] button is pressed
	Yes	[STOP] button is pressed or the time set for the stop timer of the edge trigger recording is reached
Yes	No	[STOP] button is pressed or the level signal changes to an invalid level
	Yes	[STOP] button is pressed, the level signal changes to an invalid level, or the signal whose level is specified is invalid and the stop timer setting for the edge trigger recording is reached

The postrecording function continues to record video after the recording stop trigger event. The amount of time to continue recording after the stop-recording event can be set from the Remote Control Panel.

Recording stops also under the following conditions.

- There is no more space left on the P2 card.
- When an administrator setup is started.
- When an error is detected on a P2 card and recording is no longer possible.
- When the stop time of programmed recording (see “Programmed recording” on pages 28, 29) is reached.
- When a 16 GB or higher capacity P2 card is inserted and the maximum number of recording days or files has been exceeded.

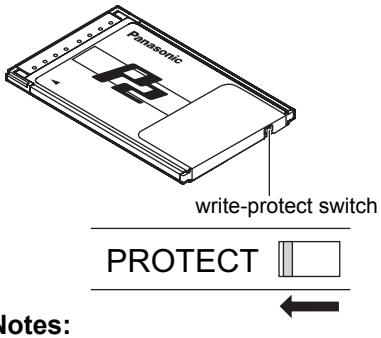
Notes:

- Continuous video and audio from starting to stopping recording, and including prerecording and postrecording periods, are recorded as one file on the P2 card.
- If recording time exceeds 17 hours, or if the size of one file would exceed 4 GB, the data is automatically split into multiple files during recording.
- Once recording starts, it may not be possible to stop it during the first five seconds (approx.). Pressing the [STOP] button during this period causes the [REC] lamp to blink for about one second as recording continues.
- Pressing the [STOP] button when recording is already stopped also causes the [REC] lamp to blink for about one second.
- When recording is stopped by the stop timer at the end of the Rec Continue Time, the postrecording function is disabled.
- After recording is started by a level trigger signal, it continues for at least one minute regardless of changes to the signal level. During this period, you can press the [STOP] button to interrupt the recording.
- If the [REC] button was pressed multiple times and the recording trigger set as the edge signal had multiple active edges, Rec Continue Time is applied to the last button press and active edge.
- Intermittent recording does not stop due to the Rec Continue Time.

On Recording

Write-protect switch

The P2 card is equipped with a write-protect switch. Sliding this switch to the PROTECT position prevents writing data, formatting P2 cards and deleting files.

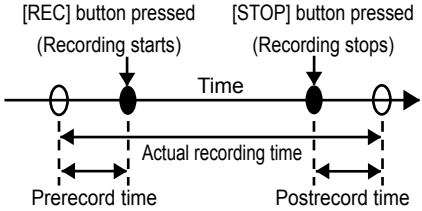


Notes:

- Any attempt to change the position of the write-protect switch during power-on will have no effect. To produce the effect, turn the power off and then turn it on again or remove the card and then insert it again.
- If the write-protect switch is set to the PROTECT position on any of the cards in the two card slots, recording will not start.

Prerecording and postrecording

Prerecording is the capability of including material from an interval before the specified start point in a recording. Similarly, postrecording is the capability of including material from an interval after the specified stop point in a recording.
Prerecording and postrecording times can be set for each recording time.
Audio prerecording and postrecording times can be set separately from video, so prerecording and postrecording audio may be partly omitted. Because video prerecording and postrecording time settings have priority, audio prerecording and postrecording times cannot be set longer than video prerecording and postrecording times.



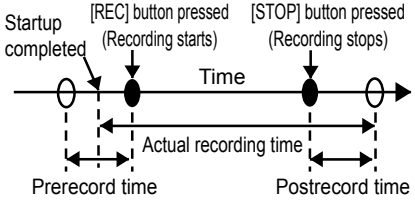
Note:

Pressing the [STOP] button turns off the [REC] lamp and video and sound recordings stop when the post record interval has elapsed. Then the [BUSY] lamp goes off.

In the cases shown below, the actual prerecord and postrecord time may be shorter than the respective setting.

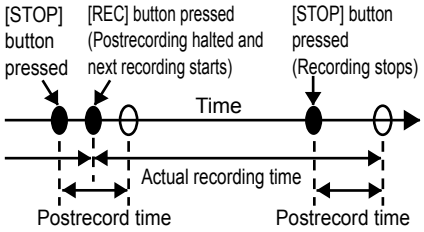
■ If recording is started immediately after system startup

Prerecord time will be shorter.



■ If recording is started during postrecord interval

Postrecording will be terminated and next recording starts. There is no prerecording interval for the second recording.

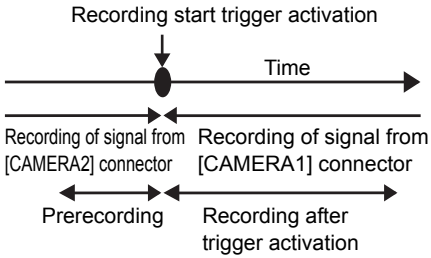


Notes:

- If you press the [REC] button and [STOP] button alternately in rapid succession, the system may not separate the two recording sessions, resulting in a single video file.
- If the remaining capacity of the P2 card is low, the prerecord time or post-record time may become shorter.
- Postrecording is interrupted by playback, trial shoot (RecCheck), file restoration or administrator setup.

Selecting the video source to record

You can select and record video input at the [CAMERA1] or [CAMERA2] connector on the rear panel of the recorder. Also, when the action set for the detection of trigger signals (GPIO1 - 8) is “CAM1REC” or “CAM2REC” and the trigger signal is enabled, the selected video is recorded. If prerecording is enabled and the video source is switched by a recording trigger, the prerecord video is taken from the source selected before switching, and the video is taken from the source selected after switching. You can select whether the video source is switched by the recording trigger or not, as well as selecting which video is recorded upon switching.



Notes:

- When switching video input, the video or audio may be briefly disrupted.
- For best results, minimize the amount of video source switching while recording.

Audio sources when recording

The Memory Card Video Recorder can record up to two audio channels (Audio1 and Audio2). Out of the three audio input connectors on the rear panel ([AUDIO IN 1, 2], and [IN CAR MIC]), the signal of the source connected to the [AUDIO IN 1] connector will always be recorded on the Audio1. For the Audio2, you can select either the sound from the [AUDIO IN 2] connector or the [IN CAR MIC] connector. This selection is made using the Remote Control Panel.
The following two audio recording modes are available: INCAR and WMIC

■INCAR
Audio input at the [IN CAR MIC] connector is recorded on the second audio channel (Audio2).

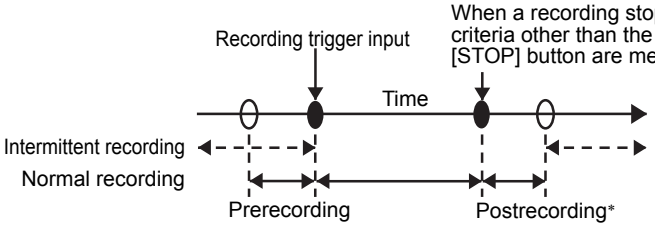
■WMIC
Audio input at the [AUDIO IN 2] connector is recorded on the second audio channel (Audio2).

Power-on recording

The recorder automatically starts recording when it is powered on.
Also when the recorder is operating with the [PowerOff Time] setting, recording will start automatically when the recorder is turned on.

Intermittent recording

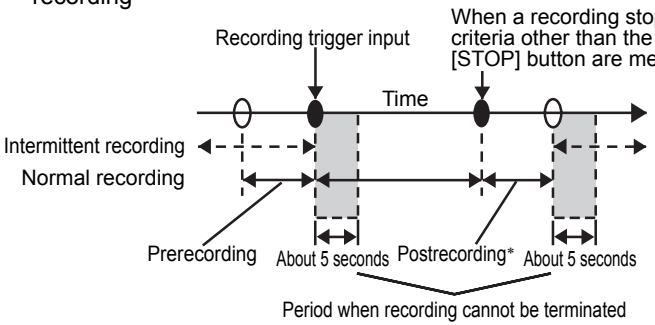
Intermittent recording records only one image per second extending recording time. Entering a recording trigger during intermittent recording interrupts intermittent recording and starts normal recording. Normal recording includes prerecording so intermittent recording and prerecording of normal recording may overlap during prerecording. When a recording stop criteria other than the [STOP] button are met, intermittent recording starts after postrecording.



*When intermittent recording is started after postrecording, audio is postrecorded for the duration of the video postrecord time, regardless of the value set for the audio postrecord time.

Under the following conditions, pressing the [STOP] button does not stop recording.

- About the first five seconds after intermittent recording transitions to normal recording (not including prerecording)
- The first five seconds (approx.) after normal recording transitions to intermittent recording



*When intermittent recording is started after postrecording, audio is postrecorded for the duration of the video postrecord time, regardless of the value set for the audio postrecord time.

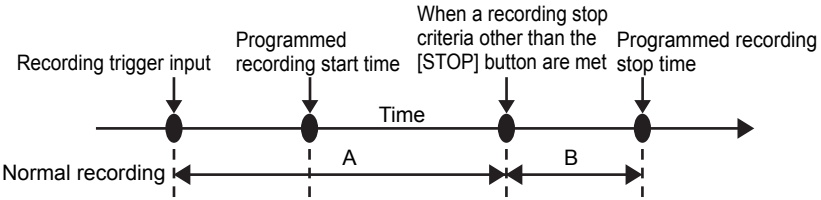
Notes:

- When both intermittent recording and power-on recording are set to “ON”, intermittent recording starts in the intermittent recording mode when the recorder is turned on. (When intermittent recording mode is set to “OFF”, normal recording starts.)
- When recording stops after the Rec Continue Time elapses, intermittent recording starts without activating postrecording.
- When prerecording time is set to something other than “0”, and a recording trigger starts normal recording during intermittent recording, the prerecording time is automatically set to start after the intermittent recording start time.
- The [REC] lamp lights during postrecording after a transition from normal to intermittent recording.
- The Rec Continue Time setting does not function outside of a recording trigger.

Programmed recording

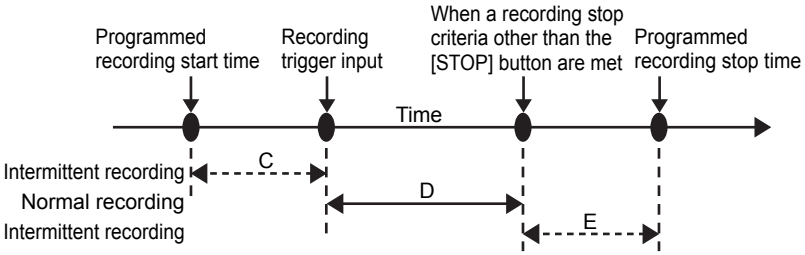
Programmed recording is a function that allows you to set recording to start and stop every day or on a specified day of the week. Programmed recording starts and stops recording according to intermittent recording setting.
For example, when intermittent recording is set to “ON”, intermittent recording starts at the set start time.

- Recording started by a recording trigger, which takes precedence over programmed recording, is a normal recording. A recording started by a recording trigger continues even if programmed recording has been set to start during this recording interval. Programmed recording starts when a recording stop criteria other than the [STOP] button are met during recording started by a recording trigger. A recording started by a recording trigger is not stopped by a stop time set using the programmed recording function.



A : A normal recording file started by a recording trigger
B : A normal recording file started by programmed recording

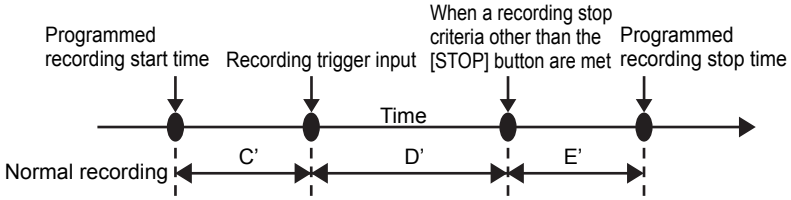
- When a recording trigger is set and both intermittent recording and programmed recording are set to “ON”, the recording is split into intermittent and normal recording files. In the following conditions, recording is split into three files.



C : A intermittent recording file started by programmed recording
D : A normal recording file started by a recording trigger
E : A intermittent recording file started by programmed recording

On Recording (continued)

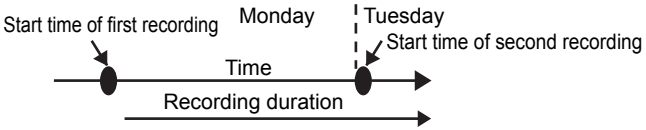
• If a recording trigger is set when intermittent recording is set to “OFF” and programmed recording is set to “ON”, only normal recording occurs and the file is not split.



C’ : A normal recording file started by programmed recording
D’ : A normal recording file started by a recording trigger
E’ : A normal recording file started by programmed recording

Notes:

• When the recording start time for the next day is reached during normal or intermittent recording, normal or intermittent recording continues without interruption.



• If the stop time is set to the same time as the start time or before the start time, the stop time will be moved to the following day.
• If the stop time and the start time on the following day are the same, the recording will become one continuous file.
• The following settings are not available during programmed recording.
  ・Rec Continue Time
  ・Video prerecording time
  ・Audio prerecording time
  ・Video postrecording time
  ・Audio postrecording time

On Recording (continued)

Changes in Intermittent recording and Programmed Recording Status

Status changes caused by button operations, recording triggers, recording stop criteria and other inputs are shown below for set intermittent recording and programmed recording conditions.

<When intermittent recording is set to "ON">

Status prior to input	Input			
	[STOP] button pressed	[REC] button pressed	When a recording stop criteria other than the [STOP] button are met	Recording trigger input
Recording stop status	No change	Intermittent recording status	No change	Normal recording status
Intermittent recording status	Recording stop status	No change	No change	Normal recording status
Normal recording status	Recording stop status	No change	Intermittent recording status	No change

<When intermittent recording is set to "OFF">

Status prior to input	Input			
	[STOP] button pressed	[REC] button pressed	When a recording stop criteria other than the [STOP] button are met	Recording trigger input
Recording stop status	No change	Normal recording status	No change	Normal recording status
Normal recording status	Recording stop status	No change	Normal recording status	No change

<When intermittent recording is set to "OFF", and programmed recording is set to "ON">

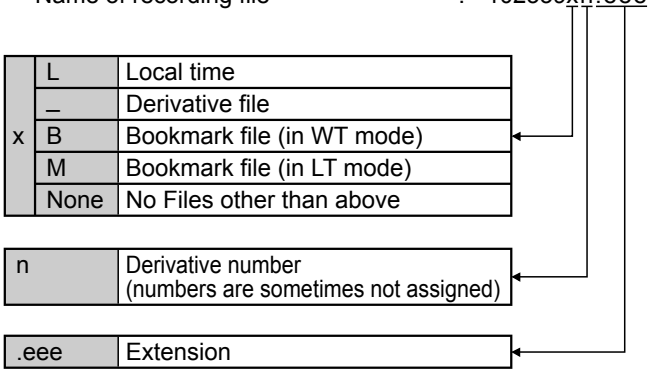
Status prior to input	Input			
	[STOP] button pressed	[REC] button pressed	When a recording stop criteria other than the [STOP] button are met	Recording trigger input
Recording stop status	No change	Normal recording initiated by a recording trigger	No change	Normal recording initiated by a recording trigger
Normal recording status initiated by programmed recording	Recording stop status	Normal recording initiated by a recording trigger	No change	Normal recording initiated by a recording trigger
Normal recording initiated by a recording trigger	Recording stop status	No change	Normal recording status initiated by programmed recording	No change

Location and Name of Recording Files

The names of folders storing recording files are created according to the Rule of Filename.

WT (world time) : "/DATA" is the base folder
LT (local time) : "/DATA /LOCAL" is the base folder

A folder indicating the recording start date is created in the above base folder and a file indicating the recording start time is created in that folder.
For example, if recording started at 10: 23: 39 on September 28, 2006,
Name of folder storing recording files : "/DATA/20060928"
Name of recording file : "102339xn.eee"



Derivative files are created when there are multiple file names with the same start time.

■Names of files that have been split up automatically

The file name when the file is automatically split consists of the recording start time to which "_n" is appended. In the file list screen, "*" is added to the end of the file name.

Recording Error Warnings

When the recorder detects that it cannot properly record audio or video, it will output the warning signals described below via GPIO9 (25-pin [GPIO/SERIAL] connector).

Data output via GPIO9

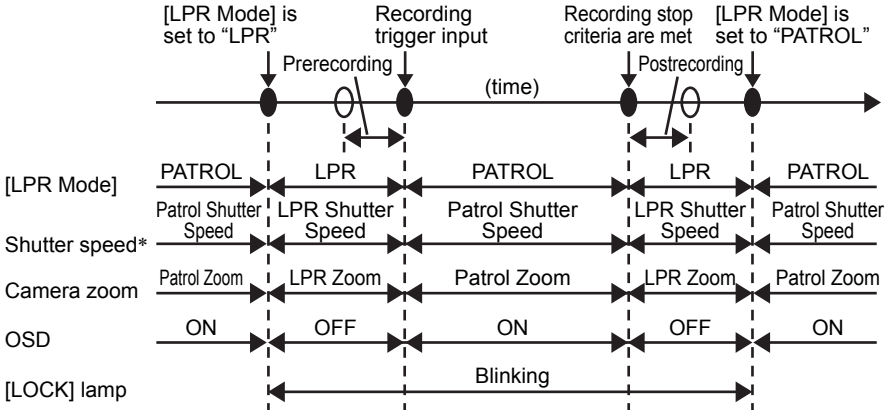
Item		When not recording	During recording	When an error occurs*1
GPIO9 for Rec	GPIO9 for Error			
DISABLE	DISABLE	Unlit*2	Unlit*2	Unlit*2
DISABLE	ENABLE	Continued (fast blinking when recording error was the prior status.)	Unlit*2	Fast blinking*4
ENABLE	DISABLE	Unlit*2	Lit*3	Unlit*2
ENABLE	ENABLE	Continued (fast blinking when recording error was the prior status. Otherwise Unlit.)	Lit*3	Fast blinking*4

∗1 A recording error indicates any of the following conditions.
- Cannot record (a detailed description of examples follow)
  - P2 card slot cover is open
  - No recordable P2 card is inserted or it is not recognized
  - No more P2 card space available
  - The write-protect switch of the P2 card is set to “PROTECT”
  - When an error is detected on a P2 card and recording is no longer possible
  - When a new unformatted 16 GB or higher capacity P2 card is inserted
  - When a 16 GB or higher capacity P2 card is inserted and the maximum number of recording days or files has been exceeded
  - When an administrator setup is started or is going on
  - When [PowerOff Time] (see “PowerOff Time” on page 75) is set to “AUTO” and the engine switch is set to the LOCK (OFF) position
- Cannot recognize video signal from the camera

∗2 Unlit: Output to GPIO9 is low (output voltage 0 V)
∗3 Lit : Output to GPIO9 is high (output voltage 5 V)
∗4 Fast blinking: Output to GPIO9 repeatedly cycles between low → high → low (250 ms cycle)

License Plate Recognition (LPR) Mode

Engaging the License Plate Recognition (LPR) mode allows you to start up the LPR system.
Set the color camera shutter speed to [LPR Shutter Speed] (1/500 or 1/1000) when using the LPR system.
When a recording trigger starts a recording during license plate recognition, however, the shutter speed automatically switches to the setting configured for [Patrol Shutter Speed].
When recording stop criteria are met, the shutter speed automatically returns to the setting configured for [LPR Shutter Speed] (1/500 or 1/1000).
The diagram below shows how changes in LPR mode settings and starting and stopping recording by an officer affect shutter speed, camera zoom, OSD and the [LOCK] lamp.



∗ The settings available for [Patrol Shutter Speed] are AUTO, 1/100, 1/500, and 1/1000.
The settings available for [LPR Shutter Speed] are AUTO, 1/500, and 1/1000.

Note:

[Patrol Shutter Speed] and [Patrol Zoom] are available also without the license plate recognition program. (When [Init LPR Mode] is set to "DISABLE", or when [Init LPR Mode] is set to "ENABLE" and [LPR Mode] is set to "PATROL".)

Setup

Factory default values are shown below. Use the Remote Control Panel to change settings. When running a PC application, the set value may be altered, or the items that can be set may be restricted.

Items officers can set:

	Setting Item	Factory Default Value	Description
1	Camera		Color camera setting
	AE[-2 -- +2]	0	Color camera video brightness setting Setting : -2, -1, 0, +1, +2
	LPR Mode	PATROL	LPR mode setting Setting : LPR (License Plate Recognition mode), PATROL (normal mode)
	LPR Shutter Speed	1/1000	Shutter speed setting with [LPR Mode] set to “LPR” Setting : AUTO, 1/500, 1/1000
	LPR Zoom	1.0	Zoom ratio setting with [LPR Mode] set to “LPR” Setting : 1.0 - 22.0
	Patrol Shutter Speed	AUTO	Shutter speed setting with [LPR Mode] set to “PATROL” Setting : AUTO, 1/100, 1/500, 1/1000
	Patrol Zoom	1.0	Zoom ratio setting with [LPR Mode] set to “PATROL” Setting : 1.0 - 22.0
2	Audio		Audio setting
	Audio2 Select	INCAR	Audio2 input selection Setting : INCAR, WMIC, LINK CAM
	Audio1	ON	Audio1 playback sound setting Setting : ON, OFF
	Audio2	ON	Audio2 playback sound setting Setting : ON, OFF
3	Setup/Info		Setup/Information
	Officer		Officer settings
	Officer 1 ID	----	Officer 1 ID
	Officer 1 first name	----	Officer 1 first name
	Officer 1 last name	----	Officer 1 last name
	Officer 2 ID	----	Officer 2 ID
	Officer 2 first name	----	Officer 2 first name
	Officer 2 last name	----	Officer 2 last name
	Operation Key Lock	OFF	Lock of buttons by an officer Setting : ON, OFF
	On Screen Type	OFF	Overlay OSD setting Setting : AUTO, SIMPLE, DETAILS, OFF
	Camera LED	ON	Color camera [REC] lamp setting Setting : ON, OFF

Items administrators can set:

	Setting Item	Factory Default Value	Description
1	Rec/Play		Recording and Playback Settings
	PowerOff Time*1	120	Time from the SIGNAL turn-off to recorder shut-down (minutes) Setting : 0, 10, 20, 30, 60, 90, 120, 180, AUTO*2
	Init Camera Select	1	Initial video input selection (upon power on) Setting : 1 ([CAMERA1] connector input) 2 ([CAMERA2] connector input) LAST*3
	Init Audio2 In Select	INCAR	Initial source selection for Audio2 input (upon power on) Setting : INCAR ([IN CAR MIC] connector input) WMIC*4 ([AUDIO IN 2] connector input) LINK CAM*5 LAST*3
	PowerOn Rec	OFF	Automatically start recording with power-on Setting : ON, OFF
	Loop Rec	OFF	Loop recording Setting : OFF fixed
	Intermittent Rec	OFF	Intermittent recording Setting : ON, OFF
	Resolution/ RecRate	Q-512k	Recording resolution and bit rate Setting : Q-512k (320x240 pixel, 512 kbps) Q-1M (320x240 pixel, 1 Mbps) F-1M (720x480 pixel, 1 Mbps) F-2M (720x480 pixel, 2 Mbps) F-1M is 10 fps, and others are 30 fps

(Continued on the next page)

∗1 Depending on the vehicle, the battery may run out of power during operation.

∗2 **When recorder operation is not controlled by a PC application:**
Power is turned off immediately. Note, however, that power is not turned off while data is exported to a USB memory device, but is turned off after completion of data export.

When recorder operation is controlled by a PC application:
Power is turned off when control from a PC application is released, or when the PC card slot cover is opened.

∗3 Applies the setting in effect when power was last turned off. Unless power is turned off properly, the operating state may not be saved correctly.

∗4 WMIC is the abbreviation for Wireless Microphone.

∗5 In LINK CAM mode, being linked with the change of camera, Audio2 sound input changes. Changing to the [CAMERA1 (CAMERA2)] connector input, sound comes from the [AUDIO IN 2 (IN CAR MIC)] connector input.

	Setting Item	Factory Default Value	Description
1	Rec Continue Time	CONTINUE	Continuous recording time (minutes) Setting : 1, 2, 5, 10, 15, 20, 30, 60, 90, CONTINUE
	PreRec Time (Video)	90	Video Prerecord time (seconds) Setting : 0, 10, 20, 30, 60, 90
	PreRec Time (Audio)	90	Audio Prerecord time (seconds) Setting : 0, 3, 10, 20, 30, 60, 90
	PostRec Time (Video)	90	Video Postrecord time (seconds) Setting : 0, 10, 20, 30, 60, 90
	PostRec Time (Audio)	90	Audio Postrecord time (seconds) Setting : 0, 3, 10, 20, 30, 60, 90
	Rule of Filename	WT	Recording file naming method Setting : WT(World time) LT(Local time)
	Init Audio2 Rec	ON	Initial on/off setting for Audio2 input (upon power on) Setting : ON, OFF, LAST*2
	Init On Screen Type	OFF	Initial OSD (on-screen display) overlay setting Setting : AUTO, SIMPLE, DETAILS, LAST*2, OFF
	GPIO9 for Rec	ENABLE	Select recording status output to GPIO9 Setting : ENABLE, DISABLE
	GPIO9 for Error	ENABLE	Select recording error status output to GPIO9 Setting : ENABLE, DISABLE
	Init Audio Out (Play)	BOTH	Initial audio output selection (upon power on) Setting : OFF, 1, 2, BOTH, LAST*2
	Play Mode	SINGLE	Select playback mode (relay playback setup) Setting : SINGLE, RELAY
	Skip Target		Skip position
	Trigger/Marker	YES	Select a trigger or marker location Setting : YES, NO
	Head of File	YES	Select the starting point of the file Setting : YES, NO
2	Programed Rec		Programmed recording setting
	Daily	–	Programmed recording for every day Setting : –, ON (Setting "–" will disable start and stop time settings)
	Mon to Sun	–	Programmed recording setting on a specific day of the week (Monday to Sunday)*4 Setting : –, ON (Setting "–" will disable start and stop time settings)

*2 Applies the setting in effect when power was last turned off. Unless power is turned off properly, the operating state may not be saved correctly.

*4 When [Daily] is set to "ON", [Mon to Sun] cannot be set.

Setup (continued)

	Setting Item	Factory Default Value	Description
3	Date/Time		Date, Time and Time Zone Settings
	TimeZone	Eastern Standard Daylight Saving Time	Time zone Hawaii Standard Time, Yukon Standard (Daylight Saving) Time, Pacific Standard (Daylight Saving) Time, Mountain Standard (Daylight Saving) Time, Central Standard (Daylight Saving) Time, Eastern Standard (Daylight Saving) Time, Atlantic Standard (Daylight Saving) Time, Asia Tokyo
	Style	ISO	Date display format setup Setting : ISO (YYYY-MM-DD HH:MM:SS format), USA (MM/DD/YYYY HH:MM:SS format)
	Date/Time	Current time	Year/Month/Day Hour:Min.:Sec.
4	Trigger		Trigger Signal (GPIO1-8) Settings
	GPIO	ON	All GPIO input or no input Setting : ON (All GPIO input permission), OFF
	Action	NONE	Action upon trigger signal (GPIO1-8) detection Setting : REC, STOP, AUTOZOOM (automatically zooms in/out or pauses) CAM1 (selects [CAMERA1] connector input) CAM2 (selects [CAMERA2] connector input) CAM1REC (records video input to the [CAMERA1] connector) CAM2REC (records video input to the [CAMERA2] connector) CAM1LED Changes the status setting (on/off) of the [REC] lamp on a Color Camera connected to the [CAMERA1] connector. NONE (no operation)

(Continued on the next page)

Setup (continued)

	Setting Item	Factory Default Value	Description
4	Detection	H	Method for trigger signal (GPIO1-8) detection. Choice of signal detection depends on set [Action]. • In REC, CAM1REC and CAM2REC modes Setting : H (high-edge trigger), Level H (high-level trigger), L (low-edge trigger), Level L (low-level trigger), B (both-edge trigger) • In CAM1, CAM2 CAM1LED, AUTOZOOM and STOP modes Setting : H (high-edge trigger), L (low-edge trigger), B (both-edge trigger) • In NONE mode Setting : H (high-edge trigger), L (low-edge trigger), SPEED (vehicle speed pulse, GPIO8 only)
	Printable	OFF	Character definition when one letter is displayed in the OSD Setting : A - Z, –, OFF
5	OSD		Embedded OSD (On Screen Display)
	OSD	ON	OSD on/off setting Setting : ON, OFF
	Display Position	L-Upper	Location display setting Setting : L-Upper (upper left), R-Upper (upper right), L-Bottom (bottom left), R-Bottom (bottom right)
	Trigger	ON	OSD setting during trigger signal (GPIO1-8) input Setting : ON, OFF
	Time	ON	Date and time display setting Setting : ON, OFF
	Source@Area	OFF	Display setting for the vehicle identification and name of a location Setting : ON, OFF

	Setting Item	Factory Default Value	Description
6	Camera		Color Camera setting
	Zoom Limit	22	Maximum zoom magnification Setting : 22, 220
	AGC Level	HIGH	Color Camera automatic gain control setting Setting : LOW, MID, HIGH, OFF
	Init Backlight	OFF	Initial backlighting compensation setting (upon power on) Setting : ON, OFF, LAST*2 (perform backlighting compensation when on)
	Init AE Shift	0	Initial exposure compensation of Color Camera video (upon power on)*5 Setting : -2, -1, 0, +1, +2, LAST*2
	Flip	OFF	Color Camera image top/bottom flip enable/disable Setting : ON (Top/bottom flip enabled), OFF (Top/bottom flip disabled)
	AutoZoom Magnification	10	Magnification of auto zoom Setting : 1, 2, 3, 4, 5, 7, 10, 15, 22
	AutoZoom Time	3	Auto zoom magnification retention time (seconds) Setting : 3, 5, 8
	Init Camera LED	ON	Initial Color Camera [REC] lamp enable/disable setting (upon power on) Setting : ON ([REC]lamp lights during recording), OFF([REC]lamp does not light), LAST*2
	Init IR Mode	AUTO	IR switching function Setting : AUTO (Automatically switch IR function on/off), OFF (Force IR function off), ON (Force IR function on), LAST*2
	IR Level	LOW	IR auto switching level setting*6 Setting : LOW, HIGH
	IR Time	30	IR auto switching level detection time (seconds)*6 Setting : 10, 30, 60, 300

(Continued on the next page)

*2 Applies the setting in effect when power was last turned off. Unless power is turned off properly, the operating state may not be saved correctly.

*5 When the [Init AE Shift] setting is “+2” and the target is dark, the image may not refresh at 30 frames/sec.

*6 The [IR Level] and [IR Time] settings apply only when the [Init IR Mode] setting is “AUTO”.

	Setting Item	Factory Default Value	Description
6	AUTO FOCUS	PRESET	Select color camera focusing method when, • [Init LPR Mode] is set to “DISABLE” • [Init LPR Mode] is set to “ENABLE” and [LPR Mode] is set to “PATROL” • a recording trigger starts recording when [Init LPR Mode] is set to “ENABLE” and [LPR Mode] is set to “LPR” Setting : AUTO (set to auto focus when zoom ratio has been changed.), PRESET (When the zoom is 3x or below, the camera is focused at a distance of about 15 m (50 feet). Subsequent zooming will engage auto focus.), DISABLE (Focus is locked at a distance of about 40 m (130 feet) and auto focus is disabled.)
	Init LPR Mode	DISABLE	LPR (License Plate Recognition) function switching Setting : ENABLE (LPR function is on), DISABLE (LPR function is off and [LPR Mode] switches to “PATROL”.)

	Setting Item	Factory Default Value	Description
7	Management Mode		Officer management setup
	Setting Method	AUTO	Officer registration procedure Setting : AUTO, MANUAL, LIST
	Operation Key Lock	OFF	Lock of buttons by an administrator Setting : ON, OFF
8	Radar/GPS		Radar Gun, GPS and Speed Settings
	Baud Rate	4800	Radar Gun communications rate (bps)*7 Setting : 1200, 2400, 4800, 9600, 19200, 38400
	Bit Length	8	Radar Gun communications data bits*7 Setting : 7, 8
	Stop Bit	1	Radar Gun communications stop bits*7 Setting : 1, 2
	Parity	NONE	Radar Gun communications parity*7 Setting : NONE, ODD, EVEN
	Model Select	ProLaser3	Radar gun type selection Setting : ProLaser3*8 Others_Analyzed_PC*8
	Connection of Radar	OFF	Radar Gun connection*7 Setting : VPU(Recorder), OFF
	Connection of GPS	VPU	GPS connection Setting : VPU(Recorder), PC, OFF
	Collection Time	5	Interval for GPS Data Collection (seconds) Setting : 1, 2, 5, 10
	Geodetic System	WGS84	Geographical coordinate system setting Setting : WGS84, TOKYO
	Speedpulse at Std Speed	20	Number of vehicle speed pulses per second at 60 kph or 40 mph Setting : 5 - 400*9
	Own Speed	OFF	Own vehicle speed at which recording starts Setting : OFF, 1 - 500
	Target Speed	OFF	Target vehicle speed at which recording starts Setting : OFF, 1 - 500
	Speed Unit	MPH	Speed measurement units Setting : MPH(M/H), KPH(Km/H)
	CAM Select in Speed	NO CHANGE	Camera selection when speed is exceeded Setting : 1, 2, NO CHANGE

∗7 When using a radar gun, contact your supplier.

∗8 Only the first 8 characters appear in the [Model Select] input field.

∗9 The number of pulses is obtained and set from the “Vehicle Speed Pulse Setting Table” (see “Vehicle Speed Pulse Setting Table (at 40 mph)” on pages 106, 107 and “Vehicle Speed Pulse Setting Table (at 60 kph)” on pages 108, 109) based on tire outside diameter and the number of pulses per wheel rotation. Verify that the set value is correct during actual driving. The outside diameter refers to the actual tire, and not rim size.

	Setting Item	Factory Default Value	Description
9	Auto Maintenance		Auto maintenance interval and date setting
	Operation	OFF	Auto maintenance operation setting Setting : ON, OFF
	Interval	6	Interval setting (months) Setting : 1, 3, 6, 12
	Day (week)	1st	Week setting Setting : 1st, 2nd, 3rd, Last
	Day (day of the week)	Mon	Day of the week setting Setting : Mon, Tue, Wed, Thu, Fri, Sat, Sun
	Time (hour)	0	Start time (hour) setting Setting : 0 – 23
	Time (minute)	0	Start time (minute) setting Setting : 0 – 59

Text Files Used with the Recorder

The following types of text files can be used by the recorder, and created with a commercially available text editor.
To display correctly, the files must meet the following specifications. Refer to “Sample Files” on pages 45, 46 for examples.

■File Types

File Types	Contents	File Name
Officer Data File	This file type contains officer settings. It is required when the officer data setting method is “AUTO” or “MANUAL”. It is also used for log-in authentication on the administrator settings screen.	\WIDKEY\ WID*****.TXT
Officer Registration File	This file type contains batch officer registration data (for up to 500 officers) for the recorder. When the “LIST” officer data setting method is selected, officers can select their own names from the registration list to load their settings into the recorder.	\WIDKEY\ WOFFICER.TXT
Administrator Registration File	This file type contains administrator registration data (for up to 10 administrators) that enables logging in to the administrator settings screen. An officer data file is required for log-in authentication on the administrator settings screen.	\WIDKEY\ WADMIN.TXT
Event Type File	File used to store event types on the recorder.	\WIDKEY\ EVTYPE.TXT

Note:

When the officer or administrator registration file is as follows, officer or administrator data is not registered, but is deleted along with previously registered officer and administrator data.

- When no officer or administrator data is present
- When the content of required items is invalid

■Saving Location and File Naming

Text files to be used on this unit must be stored in a “WIDKEY” created under the root directory of a USB memory device.
Be sure to save the Officer Data File to one USB memory device.
Officer data file names are composed of up to eight characters beginning with the prefix “WID”, and having the extension “.TXT”. There are no restrictions on naming other than the “WID” prefix.
When multiple officer data files are saved in the “WIDKEY”, the file names are automatically sorted (in ascending order), and the first 1 or 2 files are used as officer data.

Text Files Used with the Recorder (continued)

■File Specifications

Syntax:

Officer data files may contain no more than one statement per line.
Multiple statements or definitions on one line are invalid.

Line Feed Codes:

Line feeds are coded as the hexadecimal values 0Dh 0Ah or just 0Ah.

Blank Lines:

Blank lines are ignored. Aside from the line feed code, a blank line may contain only space and tab (09h) characters.

Comment Lines:

Lines beginning with "#" (ignoring leading spaces or tabs) are considered to be comment lines. These have no special meaning, but may contain notes or descriptions. Valid comment characters are those from 20h to 7Eh.

Definition Lines:

• An identifier is a definition value.
• These lines define names and other data. Leading spaces and tabs are ignored.
• Identifier descriptions are shown in the following table.

◎ : Required item ○ : An item with significance or an object of inspection × : Ignored item

Identifier	Max. characters.	Description	Officer Data File		Officer/Administrator Registration File	
			Officer 1	Officer 2	Officer	Administrator
FirstName	50	Specify officer's first name	◎	◎	◎	◎
MiddleName	1	Specify officer's middle initial	○	○	○	○
LastName	50	Specify officer's last name	◎	◎	◎	◎
ID	50	Officer number for authentication	◎	◎	◎	◎
Password	12	This should be entered when making administrator settings.	○	○	×	○
SDate	10	Shift start date YYYY-MM-DD	○	×	×	×
STime	5	Shift start time hh:mm	○	×	×	×
EDate	10	Shift end date YYYY-MM-DD	○	×	×	×
ETime	5	Shift end time hh:mm	○	×	×	×
Shift	10	A term for a work period, for example, early shift.	○	×	×	×
Area	10	Name of a location	○	×	×	×
Source	50	Vehicle identification	○	×	×	×
Border	73	Borders may be assigned to multiple officers. Defined values are ignored. For use within registration files.	×	×	○	○

Identifier	Max. characters.	Description	Event Type File
EvTypeN	99	Defines event type N. (N is a number between 1 and 10.)	○

Text Files Used with the Recorder (continued)

- If no definition is provided for a required item (that is, it is undefined), necessary data is considered to be incomplete and invalid for registration or testing. Identifiers are not case sensitive.
- All item definition values are character strings consisting of alphanumeric symbols other than “<” (3Ch), “>” (3Eh), “\” (5Ch), “&” (26h) and “,” (2Ch), control character codes 00h to 1Fh, and “Delete” character code 7Fh. Characters (including spaces) following “=” on a line are considered to be the definition value. Any invalid characters are handled as spaces. Characters exceeding the maximum character length are ignored.
- Identifiers having no defining characters are considered to be undefined. For example, if a line contains a “=” followed by a line feed character, that identifier is considered to be undefined. If an identifier is multiply defined on different lines, the last definition line has priority.

■Sample Files

Officer data file:

```
FirstName=John
#MiddleName=
LastName=Smith
ID=ICV12345
Password=panasonic
SDate=2005-09-12
STime=08:15
#EDate=2005-09-12
#ETime=20:00
Shift=Patrol
Area=WEST
Source=Car123

# Structure of officer information file
# Identifier     Max. Chars.          Description
# FirstName          50          Specify officer's first name
# MiddleName          1          Specify officer's middle initial
# LastName           50          Specify officer's last name
# ID                 50          Officer name for authentication
# Password           12          Password required to register as administrator
# SDate              10          Shift start date YYYY-MM-DD
# STime               5          Shift start time hh:mm
# EDate              10          Shift end date YYYY-MM-DD
# ETime               5          Shift end time hh:mm
# Shift              10          A term for a work period
# Area               10          Name of a location
# Source             50          Vehicle identification
```

Text Files Used with the Recorder (continued)

Officer Registration File :

```
# John Smith
FirstName=John
MiddleName=
LastName=Smith
ID=ICV12345

Border=-----------------------------------

# Jane White
FirstName=Jane
MiddleName=
LastName=White
ID=ICV12346
```

Administrator Registration File :

```
# Mike Brown
FirstName=Mike
MiddleName=
LastName=Brown
ID=ICV12347
Password=panasonic
```

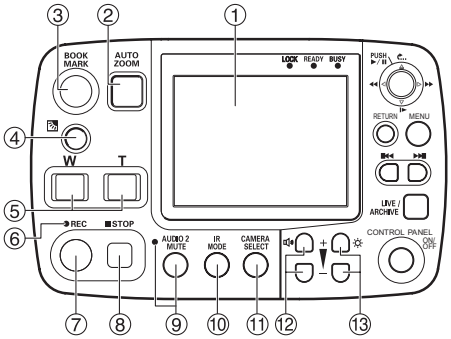
Event Type File :

```
EvType1=FOOTBALL
EvType2=BASEBALL
EvType3=HOCKEY
EvType6=TENNIS
EvType10=GOLF

# Defines event type file format
# Identifier   Max.characters.  Description
# EvTypeN   99                  Defines event type N (N is a number between 1 and 10.)
```

Control Reference Guide of the Remote Control Panel

Front panel



① LCD panel

Shows images and operation menus.

② AUTO ZOOM button*1, 2

Provides automatic control of zoom-in, pause and zoom-out operation.
The officer can set zoom ratio and pause time. (see “Zooming” on page 55)

③ BOOK MARK button*2

Press during recording or playback to enter bookmarks. A set bookmark displays an icon on the display for 1 to 2 seconds when pressed.
(see “Adding bookmarks” on pages 64, 67)

④ Backlight compensation button ( )*1, 2

Press to compensate for strong backlighting. This button toggles between ON and OFF at each press.
(see “Making a backlit image easier to view” on page 55)

⑤ Zoom buttons*1, 2

Use these buttons to zoom out (W-button) and zoom in (T-button).
(see “Zooming” on page 55)

⑥ REC lamp

Lights or flashes during recording. (see “Indicator Lamps and Recorder Status” on page 110)

⑦ REC button*2

Press to start recording video and sound to P2 card. (see “Starting recording” on page 63)

⑧ STOP button ( )*2

Stops recording. (see “Stopping recording” on page 63)

⑨ AUDIO2 MUTE button/lamp

Starts/releases recording for Audio2. Pressing this button turns the lamp on/off. While the lamp is lit, Audio2 is not being recorded. (see “To mute Audio2 input sound” on page 55)

⑩ IR MODE button*1

Switches the IR mode to one of the following modes.
AUTO: Automatically changes IR mode depending on ambient brightness.
ON: Turns on the IR mode.
OFF: Turns off the IR mode.

⑪ CAMERA SELECT button

Each press of the button toggles the recorder between the [CAMERA1] and [CAMERA2] connector inputs. (see “Selecting a camera” on page 55)

⑫ Volume control buttons ( )

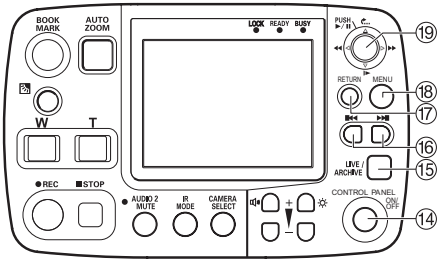
Adjusts speaker sound volume.

⑬ Brightness buttons ( )

Adjusts LCD panel brightness.

*1 A commercially available camera connected to the [CAMERA2] connector cannot be controlled.
*2 The lamp turns on when the [CONTROL PANEL ON/OFF] button is set to ON.

Front panel



⑭ CONTROL PANEL ON/OFF button

Turns on and off he LCD panel, lamp indications and buttons when the Memory Card Video Recorder is on. It cannot turn on or off the Memory Card Video Recorder or this unit (see “Turning off the LCD panel” on page 55).

⑮ LIVE/ARCHIVE button

Switches between the live and playback screen. (see “Viewing Live Video” on page 55 and “Playback” on page 65) Press this button to open the Live screen when the “Information” screen, “Archive” screen, “Restore” screen, Officer setup top screen or Setup/Admin top screen is displayed (see “Menu List” on pages 93 - 102).

⑯ Skip back button (⏮)

Press to return playback to the previous skip location. (see “Moving back to a previous skip location to start playback” on page 66)

Skip forward button (⏭)

Press to move playback the next skip location. (see “Moving to the next skip location to start playback” on page 66)

⑰ RETURN button

Returns to the previous menu or screen. (see “Returning to previous screen” on page 51)

⑱ MENU button

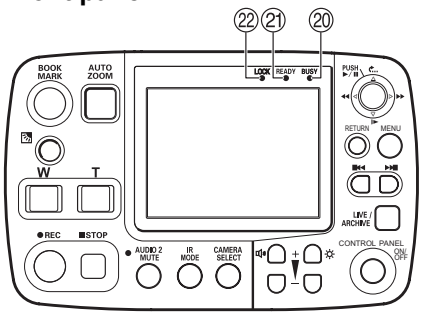
Opens menus on the LCD panel.

⑲ Cursor buttons (PUSH ▶/II, △, ▽I▶, ◁◀◀, ▷▶▶)

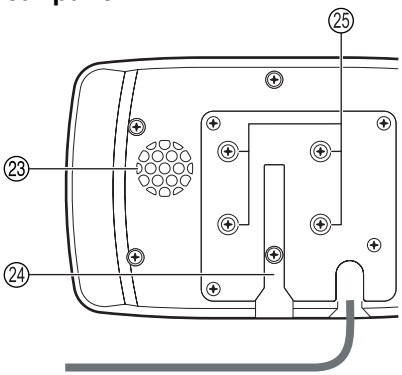
Use these buttons to manipulate menus and control playback.

- During menu operation
  - [PUSH ▶/II] : Press the center position of the button to confirm an entry.
  - [△,▽,◁,▷] : Press to move the cursor or change a set value.
- During playback
  - [▶/II] : Press the center position of the button to toggle between playback and pause.
  - [...] : Press to return to a playback position that is 7 seconds earlier.
  - [I▶] : Engages slow playback. Each press changes playback speed between 1/10 and 1/2.
  - [◀◀] : Press to rewind. Each press changes the rewind speed from x4 to x20 and x200.
  - [▶▶] : Press to fast forward. Each press changes the fast forward speed from x4 to x20 and x200.

Front panel



Rear panel



⑳ BUSY lamp

Lights or blinks when accessing a P2 card (for example during recording and playback). (see “Indicator Lamps and Recorder Status” on page 110)

㉑ READY lamp

Lights, flashes or goes off to indicate whether or not a P2 card can be recorded. (see “Indicator Lamps and Recorder Status” on page 110)

㉒ LOCK lamp

When lit:

Indicates whether or not buttons other than the [REC], [MENU], [CONTROL PANEL ON/OFF] and [RETURN] buttons are locked.

When blinking:

Indicates that the license plate recognition mode is running.

For details, refer to “License Plate Recognition (LPR) Mode” on page 33.

㉓ Speaker

In playback screen mode:

Outputs audio. However, during [❙►] slow playback, [◄◄] rewind, and [►►] fast forward, audio is not output.

In Live screen mode:

The audio sound track is not normally available. For how to monitor the audio, refer to “Checking audio” on page 59.

㉔ Anchoring groove

Provides attachment for a commercially available stand.

㉕ Securing screw holes

Use the supplied screws to attach a commercially available mounting bracket.

Basic Menu Operations

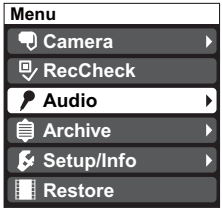
For a list of all the menus, refer to “Menu List” on pages 93 - 102.
(This list also describes menus available only to administrators.)

Example: Audio1 Test

1. Press the [MENU] button.

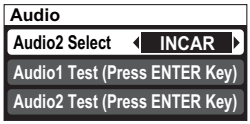
The Menu appears.
A triangle displayed at the right edge of a menu item indicates that it contains a submenu.

2. Use the cursor buttons [△,▽] to select an item.

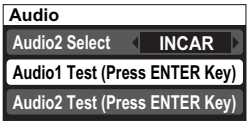


3. Press the center position of the cursor button [PUSH ▶/II] or [▷] to confirm the entry.

The selected item opens to reveal selection details.



4. Use the [△,▽] buttons to select [Audio1 Test].



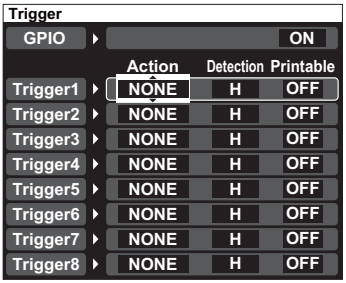
5. Press the [PUSH ▶/II] button to confirm the entry.

The Audio1 test is now ready to run.

■Use the [△,▽,◁,▷] buttons to set a value.

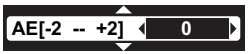
- A selected item with tiny triangles at the top and bottom allow you to change its value by pressing [△] or [▽].

(Screen example)



- A selected item with tiny triangles to the left and right allow you to change its value by pressing [◁] or [▷].

(Screen example)



■Returning to previous screen

Press the [RETURN] button to return to the previous screen. The menu is cleared when the “Archive” screen, Officer setup top screen or Setup/ Admin top screen is displayed.

■Long menus

Menus with arrows at the top and bottom contain items that are currently not shown.

Setting up/Deleting Officer Data

When a PC application is running, this unit freezes in the live screen and officer data cannot be set or deleted.

Before using this unit, you must create and configure officer data, such as an officer ID and officer name. For details on creating officer data, refer to “Text Files Used with the Recorder” on pages 43 - 46.

Three setup methods are available, called the AUTO, MANUAL and LIST modes.

Check with the administrator which mode is selected. (see “Setting Method” on page 83)

Note:

Starting up a PC application during officer data setup will abort the setup operation. The recorder will then freeze in the live screen and disable setup and deletion of officer data.

AUTO mode

When a USB memory device is connected to this unit, or when connection is detected after turning power on, the officer data for one or two officers is automatically read in and activated (see “Text Files Used with the Recorder” on pages 43 - 46).

Connect a USB memory device containing officer data to this unit.

The [READY] lamp flashes for one second:

This indicates that the data was correctly read.

The [BUSY] lamp flashes for one second:

This indicates that the data could not be correctly read.

Disconnect the USB memory device and then reconnect it. If the [READY] lamp does not flash when the USB memory device is connected again, check if the officer data file has been correctly saved to the USB memory device. If the above measures do not correct this problem, replace the USB memory device.

Notes:

- If a USB memory device is connected and the officer data is read during recording, the file will be split up at the location where reading was effectuated.
- Once the officer data has been read, the USB memory device may be removed.
- Once the officer data has been set up, it is not deleted even when power is turned off or the mode changed.

MANUAL mode

Display the menu on the LCD panel. Then read and load the officer data from the Officer setup top screen.

1. **Press the [MENU] button.**
   The Menu appears.
2. **Use the [△,▽] buttons to select [Setup/Info] and press [PUSH ▶/II] to confirm the entry.**
3. **Use the [△,▽] buttons to select [Officer] and press [PUSH ▶/II] to confirm the entry.**
   The Officer setup top screen appears.
4. **Connect a USB memory device containing officer data to this unit.**
5. **Use the [△,▽] buttons to select [Officer1].**
6. **Use the [◁,▷] buttons to select [Load] and press [PUSH ▶/II] to confirm the entry.**
   This registers officer1 and the name and ID appear.

7. To enter officer2, replace the current USB memory device with a USB memory device containing data for officer2.

8. Use the [△,▽] buttons to select [Officer2].

9. Use the [◁,▷] buttons to select [Load] and press [PUSH ▶/II] to confirm the entry.

This registers officer2 and the name and ID appear.

Note:

Long names and IDs may not be displayed in full.

LIST mode

Open the menu on the LCD panel and read in the officer data registered in this unit from the Officer setup top screen. For details on registering officer data, refer to “Load Officer” on page 79.

1. Press the [MENU] button.

The Menu appears.

2. Use the [△,▽] buttons to select [Setup/Info] and press [PUSH ▶/II] to confirm the entry.

3. Use the [△,▽] buttons to select [Officer] and press [PUSH ▶/II] to confirm the entry.

The Officer setup top screen appears.

4. Use the [△,▽] buttons to select [Officer1].

5. Use the [◁,▷] buttons to select [Select] and press the [PUSH ▶/II] buttons to confirm the entry.

A list of officers registered in this unit appears.

6. Use the [△,▽] buttons to select an officer, (use the [◁,▷] buttons to go between pages) and press [PUSH ▶/II] to confirm the entry.

The Officer setup top screen appears when officer1 has been set.

7. Use the [△,▽] buttons to select [Officer2].

8. Use the [◁,▷] buttons to select [Select] and press [PUSH ▶/II] to confirm the entry.

A list of officers registered in this unit appears.

Note:

Long names and IDs may not be displayed in full.

9. Use the [△,▽] buttons to select an officer, (use the [◁,▷] buttons to go between pages) and press [PUSH ▶/II] to confirm the entry.

The Officer setup top screen appears when officer2 has been set.

Deleting entered data

1. Press the [MENU] button.

The Menu appears.

2. Use the [△,▽] buttons to select [Setup/Info] and press [PUSH ▶/II] to confirm the entry.

3. Use the [△,▽] buttons to select [Officer] and press [PUSH ▶/II] to confirm the entry.

The Officer setup top screen appears.

4. Use the [△,▽] buttons to select [Officer1] or [Officer2].

5. Use the [◁,▷] buttons to select [Delete] and press [PUSH ▶/II] to confirm the entry.

This deletes officer data selected in Step 4.

Note:

Officer data cannot be deleted in “AUTO mode”.

Locking and Unlocking Buttons

You can lock specific buttons on the Remote Control Panel to prevent accidental pressing of the buttons.

Locking

1. **Press the [MENU] button.**
   The Menu appears.
2. **Use the [△,▽] buttons to select [Setup/Info] and press [PUSH ▶/II] to confirm the entry.**
3. **Use the [△,▽] buttons to select [Officer] and press [PUSH ▶/II] to confirm the entry.**
   The Officer setup top screen appears.
4. **Use the [△,▽] buttons to select [Operation Key Lock].**
5. **Use the [◁,▷] buttons to select "ON".**
   The [LOCK] lamp lights, and the buttons other than the [REC], [MENU], [CONTROL PANEL ON/OFF] and [RETURN] buttons, the [REC] button on this unit, and the [REC] button on the Color Camera are locked.

Notes:

- The button lock function is engaged after returning to the Live screen.
- The key lock function in the administrator setup (see "Operation Key Lock" on page 83) is independent of officer setup, so that when locked by administrator setup, the keys cannot be unlocked from officer setup.
- The Color Camera zoom and brightness buttons cannot be locked.
- Trigger signal (GPIO1-8) control (see page 37) is not locked.

Unlocking

1. **Press the [MENU] button.**
   The Menu appears.
2. **Use the [△,▽] buttons to select [Setup/Info] and press [PUSH ▶/II] to confirm the entry.**
3. **Use the [△,▽] buttons to select [Officer] and press [PUSH ▶/II] to confirm the entry.**
   The Officer setup top screen appears.
4. **Use the [△,▽] buttons to select [Operation Key Lock].**
5. **Use the [◁,▷] buttons to select "OFF".**
   The [LOCK] lamp goes off and the buttons are unlocked.

Viewing Live Video

Use the functions described below to manipulate video output by the camera and sound from the microphone.
Press the [LIVE/ARCHIVE] button to view live video. A commercially available camera connected to the [CAMERA2] connector cannot be controlled.

◎Selecting a camera

Press the [CAMERA SELECT] button.

Each press of the button toggles the unit between the [CAMERA1] and [CAMERA2] connector inputs.

Note:

Color Camera operations in the Remote Control Panel menu cannot be accessed when the [CAMERA2] connector input is selected.

◎Zooming

To view the overall scene, press the [W] button and zoom out.
To view fine details, press the [T] button and zoom in.

1. **Press the [W] button or the [T] button.**
   The camera zooms in or out while the button is kept depressed.
2. **Release the button when reaching the desired image size.**
   Pressing [AUTO ZOOM] zooms in the image to the target ratio and then pauses before zooming out towards the wide angle end. When the zoom in operation goes beyond the target ratio, it first zooms out to the target ratio.

◎Making a backlit image easier to view

A dark subject against a bright background can be made easier to view.

Press the [ ] button.

This button toggles between “ON” and “OFF” at each press.
Set this button to “OFF” for normal operation.

◎Making a dark image easier to view

Use the infrared mode to make dark images easier to view.

Press the [IR MODE] button.

The

appears.

Each press of this button switches the function from “AUTO”, “ON” and “OFF”. Set this function to “AUTO” for normal operation.

Note:

This function can be used together with “Adjusting image brightness” to make an image brighter.

◎To mute Audio2 input sound

Press the [AUDIO2 MUTE] button.

Each press of this button toggles the button between record and mute.

Note:

It is not possible to switch Audio1 sound recording in this manner.

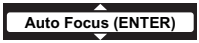
◎Turning off the LCD panel

Press the [CONTROL PANEL ON/OFF] button.

This turns off the LCD panel and lamps and disables all button functions.
Pressing this button a second time turns on the LCD panel and lamps and button operations again become available.

Adjusting image focus

This menu is available only when the [CAMERA1] connector input is selected by the [CAMERA SELECT] button.

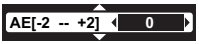
1. **Press the [MENU] button.**
   The Menu appears.
2. **Use the [△,▽] buttons to select [Camera] and press [PUSH ▶/II] to confirm the entry.**
   The 

   appears.
3. **Use the [PUSH ▶/II] button to confirm the entry.**
   The autofocus function automatically focuses the image.
4. **When the autofocus function cannot properly focus the image, use the [△,▽] buttons to select [Manual Focus].**
   The

   appears.
5. **To focus on a more distant subject, keep pressing the [▷] button and release it when it comes into focus.**
6. **To focus on a closer subject, keep pressing the [◁] button and release it when it comes into focus.**

Adjusting image brightness

This menu is available only when the [CAMERA1] connector input is selected by the [CAMERA SELECT] button.

1. **Press the [MENU] button.**
   The Menu appears.
2. **Use the [△,▽] buttons to select [Camera] and press [PUSH ▶/II] to confirm the entry.**
3. **Use the [△,▽] buttons to select [AE [-2 -- +2]].**
   The 

   appears.
4. **Press the [▷] button to make the image brighter.**
   Press the [◁] button to make the image darker.
   Set this button to “0” (zero) for normal operation.

Note:

When the [CAMERA2] connector input is selected by the [CAMERA SELECT] button, [Camera] cannot be selected and brightness cannot be adjusted.

Setting LPR mode

Use of license plate recognition requires the following setup.
This menu is available only when [Init LPR Mode] in administrator setup is set to “ENABLE”.
And this menu is available only when the [CAMERA1] connector input is selected by the [CAMERA SELECT] button.

1. Press the [MENU] button.

The Menu appears.

2. Use the [△,▽] buttons to select [Camera] and press [PUSH ▶/II] to confirm the entry.

3. Use the [△,▽] buttons to select [LPR Mode].

The

appears.

4. Use the [◁,▷] buttons to select the recognition mode.

LPR: Engages the License Plate Recognition and the [LOCK] lamp blinks. [LPR Shutter Speed] and [LPR Zoom] now become available.

PATROL: Engages the normal mode. [Patrol Shutter Speed] and [Patrol Zoom] now become available.

Notes:

- Changing [Init LPR Mode] to “DISABLE” in administrator setup while setting “LPR” engages “PATROL” and [LPR Mode] is no longer available.
- Setting “LPR” turns OSD off.

Setting shutter speed (in LPR mode)

Set a shutter speed to capture sharp video of fast-moving subjects.
This menu is available only when [Init LPR Mode] in administrator setup is set to “ENABLE” and [LPR Mode] is set to “LPR”.
And this menu is available only when the [CAMERA1] connector input is selected by the [CAMERA SELECT] button.

1. Press the [MENU] button.

The Menu appears.

2. Use the [△,▽] buttons to select [Camera] and press [PUSH ▶/II] to confirm the entry.

3. Use the [△,▽] buttons to select [LPR Shutter Speed].

The

appears.

4. Use the [◁,▷] buttons to select a shutter speed.

AUTO: Automatically adjusts the shutter speed to ambient light.

1/500, 1/1000: Set as required by the subject.

Note:

A recording started by a recording trigger during license plate recognition will automatically switch the shutter speed to “AUTO”. When recording stop criteria are met, the shutter speed automatically returns to the value set in step 4.

Setting camera zoom (in LPR mode)

The camera zoom can be set in the range 1.0 to 22.0 x.
This menu is available only when [Init LPR Mode] in administrator setup is set to “ENABLE” and [LPR Mode] is set to “LPR”.
And this menu is available only when the [CAMERA1] connector input is selected by the [CAMERA SELECT] button.

1. Press the [MENU] button.
The Menu appears.

2. Use the [△,▽] buttons to select [Camera] and press [PUSH ▶/II] to confirm the entry.

3. Use the [△,▽] buttons to select [LPR Zoom].
The

appears.
Press the [▷] button to raise and the [◁] button to lower the ratio.

Note:
A recording started by a recording trigger during license plate recognition will automatically switch the camera zoom setting to [Patrol Zoom]. When recording stop criteria are met, the camera zoom setting is automatically switched to [LPR Zoom].

Setting shutter speed (in PATROL mode)

Set a shutter speed to capture sharp video of fast-moving subjects.
This menu is available only when [Init LPR Mode] in administrator setup is set to “ENABLE” and [LPR Mode] is set to “PATROL”.
And this menu is available only when the [CAMERA1] connector input is selected by the [CAMERA SELECT] button.

1. Press the [MENU] button.
The Menu appears.

2. Use the [△,▽] buttons to select [Camera] and press [PUSH ▶/II] to confirm the entry.

3. Use the [△,▽] buttons to select [Patrol Shutter Speed].
The

appears.

4. Use the [◁,▷] buttons to select a shutter speed.
AUTO:
Automatically adjusts the shutter speed to ambient light.
1/100, 1/500, 1/1000:
Set as required by the subject.

Setting camera zoom (in PATROL mode)

The camera zoom can be set in the range 1.0 to 22.0 x.
This menu is available only when [Init LPR Mode] in administrator setup is set to “ENABLE” and [LPR Mode] is set to “PATROL”.
And this menu is available only when the [CAMERA1] connector input is selected by the [CAMERA SELECT] button.

1. Press the [MENU] button.
The Menu appears.

2. Use the [△,▽] buttons to select [Camera] and press [PUSH ▶/II] to confirm the entry.

3. Use the [△,▽] buttons to select [Patrol Zoom].
The

appears.
Press the [▷] button to raise and the [◁] button to lower the ratio.

To turn off the [REC] lamp during recording

The Color Camera [REC] lamp lights during recording. The following steps allow you to keep this lamp off at all times.

1. **Press the [MENU] button.**
   The Menu appears.
2. **Use the [△,▽] buttons to select [Setup/Info] and press [PUSH ▶/II] to confirm the entry.**
3. **Use the [△,▽] buttons to select [Camera LED].**
4. **Use the [◁,▷] buttons to select "OFF".**
   The lamp will now remain off at all times.

Selecting Audio2 input

1. **Press the [MENU] button.**
   The Menu appears.
2. **Use the [△,▽] buttons to select [Audio] and press [PUSH ▶/II] to confirm the entry.**
3. **Use the [△,▽] buttons to select [Audio2 Select].**
4. **Use the [◁,▷] buttons to select "INCAR", "WMIC" or "LINK CAM"**
   INCAR :
   Sound input through the [IN CAR MIC] terminals
   WMIC (Wireless Microphone) :
   Sound input through the [AUDIO IN 2] terminals
   LINK CAM :
   Being linked with the change of camera, sound input changes.*

Checking audio

Sound output is normally off when viewing live video. Use the following steps to check that sound is input normally.

1. **Press the [MENU] button.**
   The Menu appears.
2. **Use the [△,▽] buttons to select [Audio] and press [PUSH ▶/II] to confirm the entry.**
3. **Use the [△,▽] buttons to select [Audio1 Test] or [Audio2 Test], and then press the [PUSH ▶/II] button.**
   Sound is output while the [PUSH ▶/II] button is depressed.

Note:

The output sound may be too loud depending on the sound volume setting. Lower the sound volume as required.

* Changing to the [CAMERA1 (CAMERA2)] connector input, sound comes from the [AUDIO IN 2 (IN CAR MIC)] connector input.

Viewing the status of this unit

The following function is provided to enable viewing the status of this unit and the trigger signal (GPIO1-8) status.

1. Press the [MENU] button.

The Menu appears.

2. Use the [△,▽] buttons to select [Setup/Info] and press [PUSH ▶/II] to confirm the entry.

3. Use the [△,▽] buttons to select [On Screen Type].

4. Use the [◁,▷] buttons to select "AUTO", "SIMPLE", "DETAILS" or "OFF".

AUTO:
The simple On-Screen Display appears for 3 to 5 seconds when any of the following items have been changed.
- ⑤ Mode indication
- ⑥ Status display

SIMPLE:
The simple On-Screen Display appears.

DETAILS:
The detailed On-Screen Display appears.

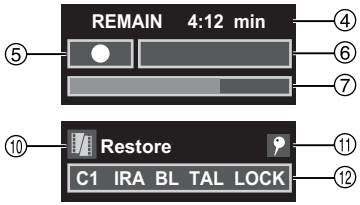
OFF:
The On-Screen Display closes.

Notes:

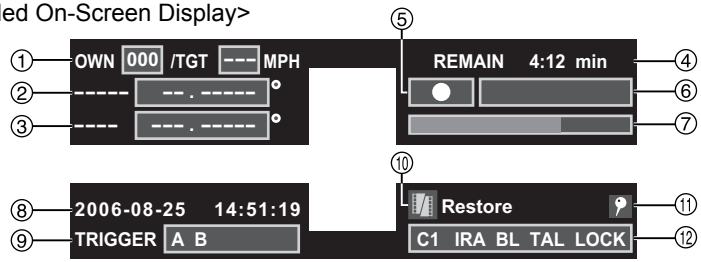
- The administrator can set the Overlay OSD (Init On Screen Type) selected at power-on.
- See the next page for how to read the On-Screen Display.
- When "AUTO" is selected and the [BOOK MARK] button is pressed, the simple On-Screen Display does not appear but the book mark icon appears for 1 to 2 seconds.

Viewing Live Video (continued)

<Simple On-Screen Display>



<Detailed On-Screen Display>



① Speed (MPH / KPH)
OWN : own vehicle speed
TGT : target vehicle speed
Target vehicle speed indication depends on the type of radar gun that is connected. For example, one ProLaser3 measurement indicates vehicle speed for a period of about 10 seconds. If another measurement is made within this 10 second period (approx.), the speed indication is updated accordingly.

Note:

"ERR" appears to indicate that the radar gun measurement result is not correct.

② Location information (latitude)

③ Location information (longitude)

④ Remaining P2 card recording time (HHH : MM)

- The remaining recording time is updated about every 30 seconds.

Note:

The total recording time does not include prerecording and postrecording time.

⑤ Mode indication
(■: paused ●: recording)

⑥ Status display
PON : power ON recording "ON"
INT : intermittent recording "ON"
<Status Display> (see "Status Display" on page 122)
CARD FULL, CARD PROTECT, VUP CARD, UNFORMATTED, REFORMAT, ILLEGAL CARD, NO CARD, CARD ERROR, RUNDOWN

⑦ Remaining time on the P2 card

⑧ Date/Time

⑨ Trigger signal (GPIO1-8) input status (GPIO 1 to 8 are displayed in order from the left.)
The characters assigned by [Printable] appear when the state set by [Detection] occurs.

⑩ Appears only when there is a file that should be restored

⑪ Mark position
: Bookmark position

⑫ Setup status of this unit
C1 : [CAMERA1] connector input is selected
C2 : [CAMERA2] connector input is selected
IR : Camera IR mode is "ON"
IRA : Camera IR mode is "AUTO"
BL : Camera backlight compensation is "ON"
TAL : Camera lamp is "ON"
LOCK : Operation button lock is "ON"

Disconnecting this unit from a PC application

Connecting a PC to this unit and starting up a PC application freezes this unit in the live screen and disables the following operations.

- Setting up/Deleting Officer Data
- A trial shoot
- Playback
- Restoring Files
- Administrator Setup

Follow these steps to disconnect a PC application from this unit to enable the above operations.

1. **Press the [MENU] button.**
   The Menu appears.
2. **Use the [△,▽] buttons to select [Setup/Info] and press [PUSH ▶/II] to confirm the entry.**
3. **Use the [△,▽] buttons to select [Disconnect PC] and press [PUSH ▶/II] to confirm the entry.**
   These steps disconnect this unit from a PC application.

Note:

For details on how to restart the PC application, see the Operating Instructions of the PC application.

Recording

◎Starting and stopping recording

■Starting recording

Press the [REC] button.

This starts video and sound recording. The live screen appears automatically if not already on. The Remote Control Panel, the Color Camera and this unit [REC] lamps go on during recording.

Note:

The Color Camera [REC] lamp goes on regardless of camera input setting (for example, the [CAMERA2] connector input being selected with the [CAMERA SELECT] button).

There are also other methods for starting recording. For details, refer to "Recording" on page 21.

■Stopping recording

Press the [STOP] button (■).

Pressing the [STOP] button turns off the [REC] lamp and video and sound recordings stop when the post record* interval has elapsed. Then the [BUSY] lamp goes off.

There are also other conditions for stopping recording. For details, refer to "Stopping Recording" on pages 22, 23.

* Post record is a function that continues recording for a preset interval after recording is turned off. Changing the setting requires administrator setup.

■Adding bookmarks

A bookmark can be added to a file that is being recorded to mark it for playback. (see “Moving back to a previous skip location to start playback” and “Moving to the next skip location to start playback” on page 66)

Press the [BOOK MARK] button.

The bookmark icon appears for 1 or 2 seconds.

Notes:

- The bookmark icon appears on the On-Screen Display. When [On Screen Type] is “OFF” (see “Viewing the status of this unit” on page 60), the bookmark icon does not appear.
- Bookmarks can be added with a minimum interval of 2 seconds.
- A bookmark cannot be entered until about five seconds after recording starts.
- It is possible to move the playback location to the bookmark during playback.
- Bookmarks can be added also during playback. (see “Adding bookmarks” on page 67)
- Bookmarks can be deleted only during playback. (see “Deleting bookmarks” on page 67)
- Bookmarks but not event types can be added during recording.
- Event types can be added only during playback. (See “Adding bookmarks” on page 67)

A trial shoot

When a PC application is running, this unit freezes in the live screen, and a trial shoot is disabled.

The following is a description of a test to check if recording can be correctly made.

1. **Press the [MENU] button.**
   The Menu appears.
2. **Use the [△,▽] buttons to select [RecCheck] and press [PUSH ▶/II] to confirm the entry.**
   A five-second recording is made and played back.

Notes:

- A trial shoot cannot be performed during recording or playback.
- The trial shoot portion of a recording is automatically deleted after playback.

Playback

When a PC application is running, this unit freezes in the live screen and the card cannot be played back.

◎ Playback

Press the [LIVE/ARCHIVE] button.
The playback screen appears and playback starts from the location where playback was last made.
If recording was started or stopped prior to pressing the [LIVE/ARCHIVE] button, playback starts from the beginning of the recorded file.

Notes:

- In the following cases, recorded files may not be played back from the beginning.
  - · When [Setup/Admin]-[Date/Time]-[Date/Time] is changed
  - · When [Setup/Admin]-[Date/Time]-[TimeZone] is changed
  - · When [Setup/Admin]-[Rec/Play]-[Rule of Filename] is changed
  - · When the clock time is corrected by GPS
- If playback was previously ended at the end of the file, playback is paused.
- If the LCD panel is turned off by using the [CONTROL PANEL ON/OFF] button, file playback stops.
- File playback stops when a PC application is started during playback.

■Name of record file

A record file name that appears in the On-Screen Display or playback file list screen takes a name that is based on the local time when recording started.
It is indicated in the format:
Year - Month - Day Hour: Min.: Sec.

Note:

A physical filename (for example, a filename that appears on a PC) can be indicated either in world or local time depending on administrator setup.

■Intermittent recording files

An intermittent recording file records only one video frame per second but no audio.

Note:

The playback speed of an intermittent recording file is slower than a normal file.

◎ Changing playback method

■Playback and pause

Press the [PUSH ▶/II] button.

Playback starts. Press again to pause playback. Use this button to pause slow, rewind and fast forward.

■Slow

Press the [I►] button.

Slow plays back at 1/10 or 1/2 of normal speed. Each press changes playback speed from 1/10 to 1/2 and 1/10.

Note:

Intermittent recording files cannot be played back at slow speed.

■Quick Replay

Press the [↶...] button.

Playback starts 7 seconds prior to the current location. During slow playback, slow playback starts 7 seconds prior to the current location.

■Rewinding

Press the [◀◀] button.

Rewinding is performed at 4, 20 or 200 times normal speed.
Each press changes the rewind speed from 4, to 20, 200 and back to 4 times normal speed.

■Fast forward

Press the [▶▶] button.

Fast forwarding is performed at 4, 20 or 200 times normal speed.
Each press changes the fast forward speed from 4, to 20, 200 and back to 4 times normal speed.

■Moving back to a previous skip location to start playback

Press the [⏮] button.

Playback starts from the previous skip location.
If the current location is 5 seconds or less away from a skip location, playback starts from the skip location before the previous skip location.
However, if the current location is 5 seconds or less away from the first skip location in the file, playback starts from a skip location in the previous file.
If there is no previous file, playback starts from the current location without skipping.

■Moving to the next skip location to start playback

Press the [⏭] button.

Playback starts from the next skip location.
If the current location comes after the last skip location in the file, playback starts from a skip location in the next file. If there is no next file, playback starts from the current location without skipping.

Notes:

- The skip location may be a bookmark, head of file or a trigger position (one per file) at which recording began. However, no trigger position can exist in automatically divided files.
- One of the following icons may appear On-Screen for about 2 seconds depending on the location playback skips. When not shown in an On-Screen Display, they appear on the LCD panel.
  TOP : File beginning
  : Trigger position
  : Bookmark position
- It is recommended that the skip location be placed at the [Trigger/Marker] or [Head of File] in the administration setup. (see “Skip Target” on page 78)
- Up to 999 bookmarks can be skipped. You cannot skip to the bookmark position exceeding this limit.
- When the [⏮] button or [⏭] button is pressed, playback stops momentarily while the skip location is searched for, and then playback resumes from that position.

◎Setting bookmarks

■Adding bookmarks

Bookmarks can be added to a file during playback, pause or slow playback. Loading event types from a USB memory device in advance to the recorder allows the operator to add both bookmarks and event types. (See "Load Event Type" on page 79)

When no event types are loaded

1. Press the [BOOK MARK] button.

- A bookmark icon appears.
- Playback or slow playback stops for a short while and then resumes.

When event types are loaded

1. Press the [BOOK MARK] button.

* appears.

2. Use the [◁,▷] buttons to select an event type and press the [BOOK MARK], [RETURN] or [MENU] button to confirm the entry.

- The recorder returns to previous playback status, and the bookmark icon appears enabling insertion also of event types.
- Playback or slow playback stops for a short while and then resumes.

Notes:

- The bookmark icon appears on the On-Screen Display. When [On Screen Type] is "OFF" (see "Viewing the status of this unit" on page 60), the bookmark icon does not appear.
- Bookmarks can be added with a minimum interval of 2 seconds.
- Playing back a segment with a bookmark shows a bookmark icon for about 2 seconds.

■Deleting bookmarks

When no event types are loaded

1. Press the [BOOK MARK] button when a bookmark icon appears during playback, pause or slow playback.

- This deletes the bookmark icon .
- Playback or slow playback stops for a short while and then resumes.

When event types are loaded

1. Press the [BOOK MARK] button.

* appears.

2. Use the [◁,▷] buttons to select "DEL" and press the [BOOK MARK], [RETURN] or [MENU] button to confirm the entry.

- The bookmark icon and the event type are deleted and the recorder returns to previous playback status.
- Playback or slow playback stops for a short while and then resumes.

Note:

Bookmarks cannot be added or deleted during rewind and fast forward.

---

* • The last used event type appears.
  • The last used event type remains even after a power off. However, an event type that is reloaded, appears as "----".
  • Long event type character strings may not be displayed in full.
  • Event types where bookmarks cannot be set, for example a recording file with unregistered event types, are displayed in gray.

Selecting a file for playback

1. Press the [MENU] button.

The Menu appears.

2. Use the [△,▽] buttons to select [Archive] and press [PUSH ▶/II] to confirm the entry.

The playback file list screen appears.

Notes:

- [Archive] is not available when there are no playback files.
- Files appear in the order of the filenames (see “Rule of Filename” on page 76) that are assigned at recording.

“WT” (world time) files are displayed in recording start order (but the time is converted and indicated in local time)

↓

“LT” (local time) files are displayed in recording start order.

- When a file is recorded across two P2 cards and is split into two files, the start time of the latter file is suffixed by “∗”. Also, if two or more files have the same start time, the start time of the second and succeeding files are suffixed by “∗”.

3. Use the [△,▽] buttons to select a file to play back.

(Use the following functions to go between pages.)

- Press the [◁,▷] buttons once to turn pages one at a time.
- Keep pressing the [◁,▷] button to go quickly between pages. This function turns pages up to page 3 in one-page increments and pages from page 4 in 10-page increments.

4. Use the [PUSH ▶/II] button to start playback.

Playback starts from the beginning of the file.

When playback reaches end of the file, playback is paused.

Turning Audio1 and 2 ON and OFF

1. Press the [MENU] button.

The Menu appears.

2. Use the [△,▽] buttons to select [Audio].

3. Use the [△,▽] buttons to select [Audio1] or [Audio2].

4. Use the [◁,▷] buttons to select “ON” or “OFF”.

Note:

An administrator can set the audio output (Init Audio Out (Play)) selected at power-on.

Viewing the status of this unit

Use the following function to see the status of this unit or trigger signal (GPIO1-8) status when a played back file was recorded.

1. Press the [MENU] button.

The Menu appears.

2. Use the [△,▽] buttons to select [Setup/Info] and press [PUSH ▶/II] to confirm the entry.

3. Use the [△,▽] buttons to select [On Screen Type].

4. Use the [◁,▷] buttons to select "AUTO", "SIMPLE", "DETAILS" or "OFF".

AUTO : The simple On-Screen Display appears for 3 to 5 seconds when any of the following items have been changed.
- ④ Playback filename
- ⑤ Mode indication
- ⑥ Playback speed and status indication

SIMPLE:
The Simple On-Screen Display appears.

DETAILS:
The Detailed On-Screen Display appears.

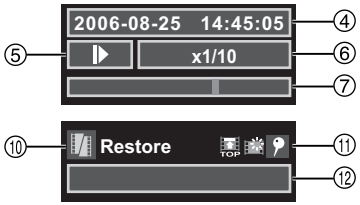
OFF:
On-Screen Display closes.

Notes:

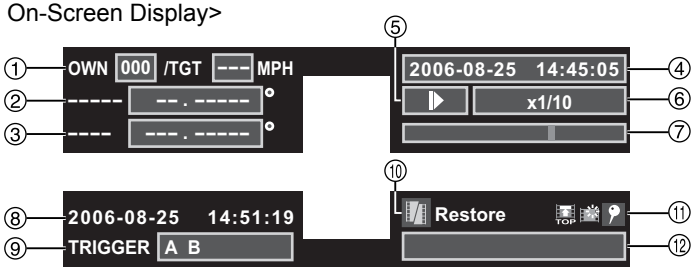
- An administrator can set the Overlay OSD (Init On Screen Type) selected at power-on.
- See the next page for how to read the On-Screen Display.
- When "AUTO" is selected and the [BOOK MARK] button is pressed or the bookmark position is reached, the simple On-Screen Display does not appear but the bookmark icon appears for 1 to 2 seconds.
- When "AUTO" is selected and the trigger position is reached, the simple On-Screen Display does not appear but the trigger icon appears for 1 to 2 seconds.

Playback (continued)

<Simple On-Screen Display>



<Detailed On-Screen Display>



① Speed (MPH / KPH)
OWN: own vehicle speed
TGT: target vehicle speed
② Location information (latitude)
③ Location information (longitude)
④ Playback filename
(Local time at start of recording)
"NO FILE" appears when there is no file to play back.
⑤ Mode indication
► : Playback
❚❚ : Pause
►► : Fast forward
◄◄ : Rewind
❙► : Slow
⑥ Playback speed and status indication
<Speed>
x1/10, x1/2, x4, x20, x200
<Status Display> (see "Status Display" on page 122)
READ ERROR, META ERROR, PLAY ERROR
⑦ Playback location (in file units)
⑧ Date/Time
⑨ Trigger signal (GPIO1-8) input status
(GPIO 1 to 8 are displayed in order from the left.)
The characters assigned by [Printable] appear when the state set by [Detection] occurs.
⑩ Appears only when there is a file that should be restored
⑪ Mark position
TOP : File beginning
: Trigger position
: Bookmark position
⑫ Sound output setting
(►: appears only during playback)
A1 : Audio1 is output
A2 : Audio2 is output

Restoring Files

When a PC application is running, this unit freezes in the live screen and files cannot be restored.

If the power of this unit is turned off or a P2 card is removed during recording, the file will be corrupted and cannot be played back.

"Restore" appears on the On-Screen Display when there is a file on the P2 card that needs to be restored.

(This message does not appear when [On Screen Type] is set to "OFF".)

[Restore] in the Menu is normally disabled, but is enabled upon detecting a file that cannot be played back.

Use the following steps to process any file that needs to be restored.

1. Press the [MENU] button.

The Menu appears.

2. Use the [△,▽] buttons to select [Restore] and press [PUSH ▶/II] to confirm the entry.

The Restore confirmation screen appears.

3. Use the [◁,▷] buttons to select [Restore] and press [PUSH ▶/II] to confirm the entry.

This opens the file restore screen, starting a file restore operation.

The screen prior to Step 1 above reappears when the file is restored.

Select [Cancel] during a restoring to cancel the restore process.

Notes:

- An interrupted restore process can be resumed at a later time.
- Recording is still available even if there are files in need of restoration.
- A recording trigger detected during a restore process or pressing the [REC] button will interrupt the process and start recording.
- Files that must be restored do not appear on the playback file list screen. Make sure to restore the files beforehand.
- Since a seriously corrupted file may not be possible to restore, do not turn off the unit during P2 card access (for example, during recording) and do not remove a P2 card when the [BUSY] lamp is lit or blinking.
- Starting up a PC application during file restoration will abort the file restore operation. This unit will then freeze in the live screen and files cannot be restored.
- Starting a file restore operation from a PC application causes the following screen transitions.
  - ① The "Under Restore Mode from PC…" standby screen replaces the live screen.
    If the file restore operation on the PC application is canceled, the live screen reappears.
  - ② Starting up file restoration opens the file restore screen.
    The live screen will reappear if the file restore operation is canceled on this unit.
    If the PC application is used to disconnect the Memory Card Video Recorder from the PC application, the file restore operation is also aborted and the live screen reappears.
  - ③ The live screen reappears when the file restore operation completes.

Displaying Product Information

■Viewing P2 card type and software version

1. Press the [MENU] button.

The Menu appears.

2. Use the [△,▽] buttons to select [Setup/Info] and press [PUSH ▶/II] to confirm the entry.

3. Use the [◁,▷] buttons to select [Information] and press [PUSH ▶/II] to confirm the entry.

- This displays P2 card model and card information. The following information appears depending on P2 card type.
  P2 cards:
  - UNFORMATTED
  - CARD PROTECT
  - REFORMAT
  - CARD ERROR
  - CARD FULL
  - RUNDOWN
  - **Days
    (**: Number of recording days (see “Format” on page 86))

  Cards other than P2 cards:
  - VUP CARD
  - NO CARD
  - ILLEGAL CARD
- This opens the product information screen that contains the software version information.

■Viewing error log data

Use the following procedure to open a dialog showing up to five of the most recent errors.

1. Perform steps 1 to 3 in “Viewing P2 card type and software version”.

2. This selects [Last Errors]. Press the [PUSH ▶/II] button to accept.

This dialog shows the most recent error data (the items listed below).
- Month/day (MM/DD)
- Hour/minute (HH : MM)
- Error No.
- Error type (Fatal Error/Error)
- Error message (the first 40 characters appear)

Notes:

- Error data with a low priority is also displayed.
- The following error numbers do not appear as error log data.
  E08601, E28201 to E28203

Rebooting this unit

Should the operating status of this unit become unstable, use the following steps to reboot this unit.

1. Press the [MENU] button.

The Menu appears.

2. Use the [△,▽] buttons to select [Setup/Info] and press [PUSH ▶/II] to confirm the entry.

3. Use the [△,▽] buttons to select [Reboot] and press [PUSH ▶/II] to confirm the entry.

The Reboot confirmation screen appears.

4. Use the [◁,▷] buttons to select “Reboot” and press [PUSH ▶/II] to confirm the entry.

A reboot takes between 40 to 50 seconds to complete.

Administrator Setup

When a PC application is running, this unit freezes in the live screen and disables Administrator Setup.

The setup of this unit includes items that only an administrator is allowed to set up.

Notes:

- Starting up a PC application during Administrator Setup aborts Administrator Setup. This unit will then freeze in the live screen and disable Administrator Setup.
- Starting Administrator Setup from a PC application causes the following screen transitions.
  ① The "Under admin setup from PC…" standby screen replaces the live screen.
  ② The live screen reappears when the PC application completes Administrator Setup.
- When running a PC application, the set value may be altered, or the items that can be set may be restricted.

■Log in at the Setup/Admin screen.

1. Use a computer to copy the administrator's officer data to a USB memory device.

For details on creating a text file with the administrator's officer data, refer to "Text Files Used with the Recorder" on pages 43 - 46.

2. Connect the USB memory device to this unit.

Notes:

- To protect the [USB] connector of this unit, connect the USB extension cable (included in the cable kit) and connect the USB memory device to the extension cable.
- For details on connecting, consult your supplier.

3. Press the [MENU] button.

The Menu appears.

4. Use the [△,▽] buttons to select [Setup/Info] and press [PUSH ▶/II] to confirm the entry.

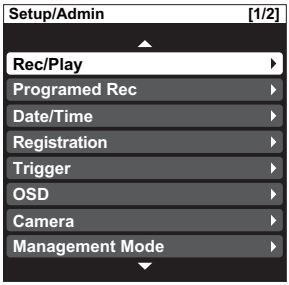
Note:

Some USB memory devices may not be properly recognized.

5. Use the [△,▽] buttons to select [Admin] and press [PUSH ▶/II] to confirm the entry.

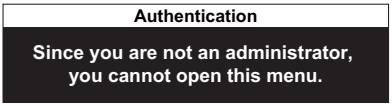
The first of the files automatically sorted (in ascending order) from the USB memory device is loaded as the administrator's officer data.
This unit searches to determine whether officer data for the administrator has already been registered, and in the following cases, the Setup/Admin top screen appears.

- When no officer data for the administrator is registered, such as immediately after purchase.
- When identical officer data is already registered for the administrator.



(Continued on the next page)

If officer data is already registered for the administrator but is not identical, the following screen appears before the Menu automatically reappears. Obtain correct data from the administrator and repeat operations from Step 1 above.



Note:

Refer to “Setup” on pages 35 - 42 for information on the factory defaults.

Rec/Play

■PowerOff Time

Use this function to set the interval after which the Remote Control Panel and this unit will shut down after the ignition switch has been set to the LOCK (OFF) position.

Setting (min.):

0, 10, 20, 30, 60, 90, 120, 180, AUTO*1

■Init Camera Select

Select the camera selected at power-on.

1: Color Camera connected to the [CAMERA1] connector

2: Commercially available camera connected to the [CAMERA2] connector

LAST: See footnote.*2

■Init Audio2 In Select

Select the Audio2 sound input at power-on.

INCAR : Sound input through the [IN CAR MIC] connector

WMIC : Sound input through the [AUDIO IN 2] connector

LINK CAM: Being linked with the change of camera, sound input changes.*3

LAST : See footnote.*2

■PowerOn Rec

Use this function to set recording to start when this unit is turned on.

Setting : ON, OFF

■Loop Rec

Setting : OFF fixed

■Intermittent Rec

Use this function to record*4 one video frame per second.

Setting : ON, OFF

■Resolution/RecRate

Use this function to set the screen resolution and the recording rate.

Q-512kbps :
320 × 240 512 kbps 30 fps

Q-1Mbps :
320 × 240 1 Mbps 30 fps

F-1Mbps :
720 × 480 1 Mbps 10 fps

F-2Mbps :
720 × 480 2 Mbps 30 fps

∗1 **When recorder operation is not controlled by a PC application:**
Power is turned off immediately. Note, however, that power is not turned off while data is exported to a USB memory device, but is turned off after completion of data export.
When recorder operation is controlled by a PC application:
Power is turned off when control from a PC application is released, or when the PC card slot cover is opened.

∗2 Applies the setting in effect when power was last turned off. Unless power is turned off properly, the operating state may not be saved correctly.

∗3 Changing to the [CAMERA1 (CAMERA2)] connector input, sound comes from the [AUDIO IN 2 (IN CAR MIC)] connector input.

∗4 Normal recording records 10 or 30 video and audio frames per second.

■Rec Continue Time*1

Use this function to set recording continue time for normal recording when a trigger is entered or when the [REC] button is pressed.

Setting (min.) : 1, 2, 5, 10, 15, 20, 30, 60, 90, CONTINUE

■PreRec Time (Video)*2

Use this function to set how much of already stored video will be retained when a trigger is entered or the [REC] button is pressed.

Setting (sec.) : 0, 10, 20, 30, 60, 90

■PreRec Time (Audio)*2

Use this function to set how much of already stored audio will be retained when a trigger is entered or the [REC] button is pressed. However, the audio recording starts at the same time when the video pre-recording starts, even if the PreRec Time (Audio) is set longer than the PreRec Time (Video).

Setting (sec.) : 0, 3, 10, 20, 30, 60, 90

■PostRec Time (Video)*3

Use this function to set the time interval video recording will continue after the [STOP] button is pressed.

Setting (sec.) : 0, 10, 20, 30, 60, 90

■PostRec Time (Audio)*3

Use this function to set the time interval audio recording will continue after the [STOP] button is pressed. However, the audio recording ends at the same time when the video postrecording ends, even if the PostRec Time (Audio) is set longer than the PostRec Time (Video).

Setting (sec.) : 0, 3, 10, 20, 30, 60, 90

■Rule of Filename

Use this function to set the rules for filenames generated during recording.

WT : World time
LT : Local time

■Init Audio2 Rec

Sets Audio2 recording when the power is turned ON.

ON : recording is performed
OFF : recording is not performed
LAST : See footnote.*4

■Init On Screen Type

Use this function to set On-Screen Display used when the power is on.

Setting : AUTO, SIMPLE, DETAILS, LAST*4, OFF

∗1 Intermittent recording and programmed recording extended by Rec Continue Time do not stop.
∗2 Intermittent recording and programmed recording do not include prerecording time.
∗3 If recording is stopped by Intermittent recording, programmed recording and Rec Continue Time, postrecording is not included.
∗4 Applies the setting in effect when power was last turned off. Unless power is turned off properly, the operating state may not be saved correctly.

■GPIO9 for Rec

Enables or disables output of recording status signals to GPIO9.
When enabled, a high level (output voltage 5 V) indicates recording is in progress.
Setting : ENABLE, DISABLE

■GPIO9 for Error

Enables or disables output of recording error status signals to GPIO9.
When enabled, a high level (output voltage 5 V) and a low level (output voltage 0 V) change at high speed to indicate recording error status.
Setting : ENABLE, DISABLE

■Init Audio Out (Play)

Use this function to set Audio Out used when the power is on.

OFF : Audio1 and Audio2 are not output.
1 : Audio1 is output
2 : Audio2 is output
BOTH : Both Audio1 and Audio2 are output.
LAST : See footnote.*

■Play Mode

Use this function to turn all valid files starting in order from the oldest file on two P2 cards into a virtual file for playback.

SINGLE: Normal playback for playing back files one at a time.
RELAY : Plays back multiple files as one single file without the need for further operation. Playback pauses upon reaching the end of the large virtual file (the most recently recorded file). Playback operation is the same as for normal playback.

Notes:

- Slow playback of a virtual file that contains intermittent recording files will revert to normal playback speed at the start of a an intermittent recording file. Slow playback is not restored for subsequent normal recording files.
- Quick replay starts playback 7 seconds prior to current location.
- A large virtual file consists of multiple files and video and sound may be momentarily interrupted in playback between files.

* Applies the setting in effect when power was last turned off. Unless power is turned off properly, the operating state may not be saved correctly.

Skip Target

Use this function to set the skip location (the amount of time that is skipped) when the [Skip back] or [Skip forward] button is pressed.

■Trigger / Marker

Playback jumps to the trigger position (one per file) at which recording began, or to a bookmark position, whichever found earlier. However, no trigger position can exist in automatically divided files.

Setting : YES, NO

■Head of File

Use this function to move to the beginning of a file during playback.

Setting : YES, NO

Notes:

- When both [Trigger/Marker] and [Head of File] are set to "YES", playback will restart from the first trigger or bookmark that appears or restarts from the beginning of the file.
- [Trigger/Marker] and [Head of File] cannot both be set to "NO".

Programed Rec

Use this function to set recording to start and stop every day or on a specified day of the week.

■Daily*

Makes daily recordings from the set start time to the set stop time.

ON: Start time and stop time can be set.

– : No setting is available.

Note:

When [Daily] is set to "ON", the [Mon] to [Sun] field changes to "–" and no setting can be made.

■Mon to Sun*

Makes recordings from the set start time to the set stop time on a specified day of the week.

ON: Start time and stop time can be set. A time for the next day can be set.

– : No setting is available.

Notes:

- The start time must be set to a time that comes at or later than the stop time for the previous day.
- When the stop time is set to the same time as the start time or to a time prior to the start time, the stop time will be set for the next day.
- Even at a time outside of the set start time and stop time period, recording will start if the recording start criteria are met, for example, when a recording trigger is input or the [REC] button is pressed.
- Programmed recording will start if the power is turned on in the period between the start time and stop time.
- If auto maintenance is performed during programmed recording, recording will be interrupted for 40 to 50 seconds.

* The <Duration> field indicates the time period from start time to stop time.

Date/Time

■TimeZone

Indicates time difference from world standard time.

Hawaii : Hawaiian standard time
Yukon : Alaska standard time
Yukon DST : Alaska daylight saving time
Pacific : Pacific standard time
Pacific DST: Pacific daylight saving time
Mountain : Mountain standard time
Mountain DST: Mountain daylight saving time
Central : Central standard time
Central DST: Central daylight saving time
Eastern : Eastern standard time
Eastern DST: Eastern daylight saving time
Atlantic : Atlantic standard time
Atlantic DST : Atlantic daylight saving time
Asia Tokyo: Japan standard time

■Style

Use this function to set a date format.

ISO : YYYY-MM-DD
HH : MM : SS
USA: MM/DD/YYYY
HH : MM : SS

■Date/Time

The “Set” button appears when [Date/Time] is used to change the date and time. Select the “Set” button and use the [PUSH ▶/II] button to confirm the entry. The “Set” button disappears upon confirmation. Use the [MENU] button, [CONTROL PANEL ON/OFF] button, [RETURN] button or the [LIVE/ARCHIVE] button to cancel.

Setting : Year/month/day
hour : minute : second

Registration

■Load Admin

Use this function to load administrator data from a USB memory device, overwriting any existing administrator data.

Note:

No administrator data is registered when shipped from the factory.

■List Admin

Use this function to view the IDs of administrators and officer names already registered in this unit. Use the [△,▽] buttons to go between pages.

■Load Officer

Use this function to load officer data from a USB memory device, overwriting any existing officer data.

Note:

No officer data is registered when shipped from the factory.

■List Officer

Use this function to view the IDs of officers and officer names already registered in this unit. Use the [△,▽] buttons to go between pages.

Note:

Long IDs and officer names may not be displayed in full.

■Load Event Type

Use this function to load event types from a USB memory device, and delete any existing event types and update all event types.

Note:

The recorder contains no event types when shipped from the factory.

■List Event Type

Displays event types stored on the recorder. Use the [△,▽] buttons to go between pages.

Note:

Long event type character strings may not be displayed in full.

Trigger

■GPIO

Use this function to turn GPIO on or off.
Setting : ON, OFF

■Trigger1 to 8

< Action >

Enter actions for detection of trigger signals (GPIO1–8). Enter "NONE" for triggers that will not be used.

REC: Record
STOP: Stop
AUTOZOOM: Automatically zooms in/out or pauses
CAM1: Selects [CAMERA1] connector input
CAM2: Selects [CAMERA2] connector input
CAM1REC: Records video input to [CAMERA1] connector
CAM2REC: Records video input to [CAMERA2] connector
CAM1LED: Changes the status setting (on/off) of the [REC] lamp on a Color Camera connected to the [CAMERA1] connector.
NONE: No operation.

< Detection >

Enter conditions for detection of trigger signals (GPIO1–8). Choice of detection method depends on the setting selected by <Action>.

- In REC, CAM1REC and CAM2REC modes

H : High-edge trigger
Level H: High-level trigger
L : Low-edge trigger
Level L : Low-level trigger
B : Both-edge trigger

- In CAM1, CAM2, CAM1LED, AUTOZOOM and STOP modes

H : High-edge trigger
L : Low-edge trigger
B : Both-edge trigger

- In NONE mode

H : High-edge trigger
L : Low-edge trigger
SPEED : Detects vehicle speed (GPIO8 only)

Notes:

- When SPEED is selected, [Printable] becomes "–" and cannot be modified. No screen is displayed, either.
- Check the [Speedpulse] setting described on page 84 before selecting SPEED. Setting SPEED to ON using an incorrect [Speedpulse] setting will generate an abnormal trigger.

< Printable >

Assign characters to be used in the OSD display.
Setting: A to Z, –, OFF (no display)

Note:

The value set by <Printable> appears when the state triggered by <Detection> prevails. However, only when a value "B" is set for <Detection>, the value set by <Printable> will appear during a high state.

OSD

■OSD

Use this function to set whether the On-Screen Display appears on the screen and is included in record files.
Setting : ON, OFF

■Display Position

Use this function to set the display position for the On-Screen Display on the screen and in record files.

L-Upper : Upper left
R-Upper : Upper right
L-Bottom : Lower left
R-Bottom : Lower right

■Trigger

Use this function to turn trigger display on or off upon trigger signal (GPIO1–8) inputs.
Setting : ON, OFF

Note:

The Detailed On-Screen Display (see "Viewing the status of this unit" on pages 60, 69) will hide this indication.

■Time

Use this function to turn date and time display on or off during recording.
Setting : ON, OFF

Note:

The Detailed On-Screen Display (see "Viewing the status of this unit" on pages 60, 69) will hide this indication.

■Display for the vehicle identification and name of a location (Source@Area)

Use this function to turn vehicle identification and name of a location on or off during recording.
This information appears as "Source@Area".

Source: The first 5 characters in the vehicle identification
Area : The first 4 characters in the name of a location

Notes:

- If the Source is less than 5 characters, the number of characters for the Area is adjusted so that the total number of characters becomes 10.
- If the Area is less than 4 characters, the number of characters for the Source is adjusted so that the total number of characters becomes 10.
- "@Area" is displayed when there is no Source.
- The vehicle identification only is displayed when there is no Area.

Camera

■Zoom Limit

Use this function to enter maximum zoom ratio.
Setting : ×22, ×220

■AGC Level

Use this function to set the level of camera input gain control.
Setting : LOW, MID, HIGH, OFF

■Init Backlight

Use this function to turn backlight compensation on or off when the power is on.
Setting : ON, OFF, LAST*

■Init AE Shift

Use this function to adjust brightness when the power is on.
Setting : -2, -1, 0, +1, +2, LAST*

■Flip

Use this function to determine whether to vertically flip camera video image or not.
Setting : ON, OFF

■AutoZoom Magnification

Use this function to set the target zoom-in ratio.
Setting : ×1, ×2, ×3, ×4, ×5, ×7, ×10, ×15, ×22

■AutoZoom Time

Use this function to set the zoom-in pause time.
Setting (sec.) : 3, 5, 8

■Init Camera LED

Use this function to turn the camera lamp on or off when the power is on.
Setting : ON, OFF, LAST*

* Applies the setting in effect when power was last turned off. Unless power is turned off properly, the operating state may not be saved correctly.

■Init IR Mode

Use this function to set the IR function when the power is on.

Setting : AUTO*1, OFF, ON, LAST*2

■IR Level

Use this function to set the IR function level during automatic switching.

Setting : LOW, HIGH

■IR Time

Use this function to set the IR function detection time during automatic switching.

Setting (sec.) : 10, 30, 60, 300

■AUTO FOCUS

Selects color camera focusing method when,

- [Init LPR Mode] is set to “DISABLE”
- [Init LPR Mode] is set to “ENABLE” and [LPR Mode] is set to “PATROL”
- a recording trigger starts recording when [Init LPR Mode] is set to “ENABLE” and [LPR Mode] is set to “LPR”

AUTO : Auto focus goes into operation when the zoom ratio is changed.

PRESET : When the zoom is 3x or below, the camera is focused at about 15 m (50 feet). Subsequent zooming will engage auto focus.

DISABLE : Focus is locked at about 40 m (130 feet) and auto focus is not available.

■Init LPR Mode

Enables or disables the LPR function (license plate recognition) when the recorder is turned on.

ENABLE: Allows changes to be made to the officer [LPR Mode]. Values set in this mode will persist through a power off and become available at the next power on.

DISABLE: Color camera shutter speed changes to “AUTO”. The zoom position for the camera at power on returns to the position it had when the power was last turned off.

---

*1 Automatically switches between ON and OFF.

*2 Applies the setting in effect when power was last turned off. Unless power is turned off properly, the operating state may not be saved correctly.

Management Mode

Management of Officer Setup

■Setting Method

Use one of the following methods to enter officer data.

AUTO : Automatically reads and loads officer data for up to two persons from a USB memory device.

MANUAL: Display the menu on the LCD panel, and then read in and configure officer data from a USB memory device on the Officer setup top screen.

LIST : Display the menu on the LCD panel and allow you to set the officer data by selecting from the list on the Officer setup top screen after reading in the officer data already stored on this unit.

■Operation Key Lock

This function locks buttons other than the [REC], [MENU], [CONTROL PANEL ON/OFF] and [RETURN] buttons, the [REC] button on this unit, and the [REC] button on the Color Camera.

Setting : ON, OFF

Notes:

- When a USB memory device containing administrator data is connected, you can press the [MENU] button to enter the Setup/ Admin top screen via the menu items. Set [Management Mode] – [Operation Key Lock] setting to “OFF” in administrator setup to release key lock.
- The key lock is activated for the first time when you move to the live screen.
- The [LOCK] lamp indicates whether the keys are locked.
- Although the key lock function is available in officer setup, when locked by administrator setup, the keys cannot be unlocked from officer setup.
- The Color Camera zoom and brightness buttons cannot be locked.
- Trigger signal (GPIO1-8) control (see page 37) is not locked.

Radar/GPS

Radar Model

■Baud Rate

Setting (bps) : 1200, 2400, 4800, 9600, 19200, 38400

■Bit Length

Setting (bit) : 7, 8

■Stop Bit

Setting (bit) : 1, 2

■Parity

Setting : NONE, ODD, EVEN

■Model Select

ProLaser3 :

The unit is set to support Kustom Signal’s ProLaser3 as standard. To use the unit with other radar guns, consult your supplier.

Others_Analyzed_PC :

Select when processing data on a PC. For details, consult your supplier.

■Addition of Model

Consult your supplier.

If you open the Addition of Model screen by mistake, press the [Cancel] button to exit.

■Connection of Radar

Use this function to specify the radar gun connection port.

VPU : when connected to this unit

OFF : when not connected

Notes:

- This unit has no function for calculating the speed of the target vehicle from the moving own vehicle.
- No distinction is made between the speed of an approaching target vehicle and a receding one.
- Some radar guns come with a function for setting conditions that enable correct measurement of target vehicle speed. Use this function according to the instructions in the Operating Instructions of the radar gun.
- Error messages appear when the radar gun is operating abnormally.

GPS

■Connection of GPS

Use this function to select GPS data source.

VPU : Uses GPS data from the GPS module attached to this unit.

PC : Uses GPS data from the PC.

OFF : Does not use GPS data.

■Collection Time

Use this function to set the time to collect GPS data.

Setting (sec.) : 1, 2, 5, 10

■Geodetic System

Use this function to set the geodetic system. Japanese maps use one of two geodetic systems. Adjust the system to the map you are using. This setting is available only when the TimeZone is set to “Asia Tokyo”.

WGS84 : World Geodetic System

TOKYO : Japan Geodetic System (old)

Speedpulse

■Speedpulse at Std Speed*

Setting the speed in MPH units :

Sets the number of 1-second pulses at 40 M/h. (Refer to the “Vehicle Speed Pulse Setting Table (at 40 mph)” on pages 106 and 107.)

Setting : 5 - 400

Setting the speed in KPH units :

Sets the number of 1-second pulses at 60 km/h. (Refer to the “Vehicle Speed Pulse Setting Table (at 60 kph)” on pages 108 and 109.)

Setting : 5 - 400

* Find and set the pulse number, based on the outside diameter of the tire and the number of pulses per tire revolution, using the “Vehicle Speed Pulse Setting Table”. Confirm the set value is correct by actually driving the vehicle. The outside diameter is the diameter of the tire from its outer edge, not its rim size.

Rec Start Information

■Own Speed

Use this function to set the speed of your own vehicle at the start of recording according to set speed unit.

Setting : OFF, 1 - 500

■Target Speed

Use this function to set the speed of the target vehicle at the start of recording according to set speed unit.

Setting : OFF, 1 - 500

■Speed Unit

Setting : MPH, KPH

Notes:

- When both own vehicle speed and target vehicle speed are set, recording starts as soon as one criterion is met.
- Own vehicle speed priority order: Vehicle speed pulse, radar gun and GPS. The priority order is vehicle speed pulse followed by GPS for a radar gun without a vehicle speed measurement function. This priority order is the same also with a vehicle recording trigger and in an On-Screen display.
- When both own vehicle speed and target vehicle speed are OFF, recording does not start.

■CAM Select in Speed

To start recording of radar gun, GPS and speed pulse (for recording speeding vehicles, etc.), select the camera that will be used.

1: Color Camera connected to the [CAMERA1] connector.

2: Commercially available camera connected to the [CAMERA2] connector.

NO CHANGE: No change is made to the current setting.

File Management

■Export

Use this function to copy video and audio data files recorded on this unit to a USB memory device. The video and audio data files on this unit are automatically deleted after copying.

Note:

When a version upgrade file is saved on the USB memory device, the error message “E28406” appears, and exporting is not performed (see “Error messages” on page 121).

■Delete All Files

Use this function to delete all video and audio data files on this unit. Select “Delete” in the confirmation dialog box that appears to delete the files or select “Cancel” to keep the files.

Notes:

- Do not make button operations or turn the power off during a delete all files operation.
- P2 card files for which the following information appears in the status display cannot be deleted.
  - CARD PROTECT
  - VUP CARD
  - UNFORMATTED
  - ILLEGAL CARD
  - NO CARD

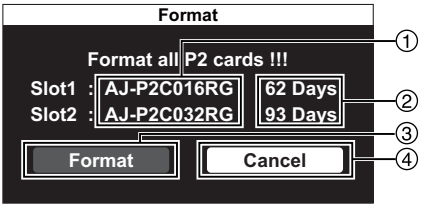
■Format

Use this function to format all P2 cards in this unit.
Note that 16 GB or higher capacity P2 cards limit the number of files that can be recorded. The table below shows the number of recording days and the maximum number of files recorded per day.

Card model number	Number of recording days	Maximum number of files recorded per day	
		With bookmarks	Without bookmarks
AJ-P2C016RG	62 days	339 files	508 files
AJ-P2C032RG	93 days	339 files	508 files

(per 16 GB or higher capacity P2 card)

The screen shown below appears.



① : Displays the model of the inserted P2 card.
② : Displays the number of recording days before formatting.
③ : Formats all P2 cards.
④ : Cancels formatting.

Notes:

- Do not make button operations or turn the power off during a format operation.
- P2 card for which the following information appears in the status display cannot be formatted.
  - CARD PROTECT
  - VUP CARD
  - ILLEGAL CARD
  - NO CARD
- Format a new 16 GB or higher capacity P2 card in this unit.
- A 16 GB or higher capacity P2 card formatted in this unit contains the folders required for the operation of this unit. Do not modify (delete, copy, move, etc.) these folders on a PC.
- A 16 GB or higher capacity P2 card whose folders have been modified on a PC must be reformatted in this unit.
- "CARD FULL" appears on the On-Screen Display when the maximum number of recording days or files has been exceeded on a 16 GB or higher capacity P2 card.
- Using two 16 GB or higher capacity P2 cards doubles the number of files that can be recorded per day. When the number of files recorded on a single day does not exceed the maximum number of files that can be recorded per day for a card, the number of recording days increases.
- Recording cannot start when the number of files recorded on the P2 cards inserted in slots 1 and 2 totals over 20,000 files.

Auto Maintenance

During continuous operation, the Memory Card Video Recorder restarts, checks files and frees memory at regular intervals to maintain system health.
When the unit is regularly turned off, auto maintenance is not required.
To use the unit without having to regularly power it off, activate auto maintenance with intervals as short as possible.
A dialog announcing the start of auto maintenance appears 10 to 20 seconds before start of maintenance. In this interval, you can use the [CONTROL PANEL ON/OFF], [REC], [STOP], [RETURN] or [PUSH ▶/II] buttons to cancel maintenance. Auto maintenance starts unless it is canceled.

Auto maintenance is started or canceled when planned maintenance date and time is reached under the following conditions.

< Execution >

- When recording stops
- Maintenance is held for a maximum of 90 minutes and recording is stopped in that interval.
- When intermittent recording is performed at a time other than programmed recording (intermittent recording stops and maintenance starts)
- During file restore operation and when Administrator Setup is performed (maintenance starts when respective process ends)
- During playback (maintenance starts when playback ends)

< Cancel >

- When recording continues beyond 90 minutes
- When the P2 card slot cover is open

Notes:

- To start recording immediately after the end of auto maintenance, set power ON recording to “ON”.
- When auto maintenance is completed, the unit is restarted and left in the power on state. Set the following items to “LAST” in Administrator Setup when auto maintenance is set to “ON”, to prevent a restart from changing the settings used before power was last turned off. Set a value other than “LAST” to set a fixed value.

< Rec/Play >

- Init Camera Select
- Init Audio2 In Select
- Init Audio2 Rec
- Init On Screen Type
- Init Audio Out (Play)

< Camera >

- Init Backlight
- Init AE Shift
- Init Camera LED
- Init IR Mode

■Next Maintenance Day

This function shows the date for the next auto maintenance operation. The set Operation, Interval, Day and Time appear at the bottom of the screen.

■Operation

Use this function to turn auto maintenance on or off.

The “Set” button appears when a setting is changed. Select the “Set” button and use the [PUSH ▶/II] button to confirm the entry. The “Set” button disappears upon confirmation. Use the [MENU] button, [CONTROL PANEL ON/OFF] button, [RETURN] button or the [LIVE/ARCHIVE] button to cancel.

Setting : ON, OFF

■Interval

Use this function to set the interval of auto maintenance.

The “Set” button appears when a setting is changed. Select the “Set” button and use the [PUSH ▶/II] button to confirm the entry. The “Set” button disappears upon confirmation. Use the [MENU] button, [CONTROL PANEL ON/OFF] button, [RETURN] button or the [LIVE/ARCHIVE] button to cancel.

Setting (months) : 1, 3, 6, 12

■Day

Use this function to set the week and day for performing auto maintenance.

The “Set” button appears when a setting is changed. Select the “Set” button and use the [PUSH ▶/II] button to confirm the entry. The “Set” button disappears upon confirmation. Use the [MENU] button, [CONTROL PANEL ON/OFF] button, [RETURN] button or the [LIVE/ARCHIVE] button to cancel.

Setting (week) : 1st, 2nd, 3rd, Last

Setting (day) : Mon, Tue, Wed, Thu, Fri, Sat, Sun

■Time

Use this function to set auto maintenance start time.

The “Set” button appears when a setting is changed. Select the “Set” button and use the [PUSH ▶/II] button to confirm the entry. The “Set” button disappears upon confirmation. Use the [MENU] button, [CONTROL PANEL ON/OFF] button, [RETURN] button or the [LIVE/ARCHIVE] button to cancel.

Setting : HH:MM

Notes:

- If a setting is changed, the cancellation of an auto maintenance day prior to a change will remain in the error log data.
- Restarting this unit (see “Rebooting this unit” on page 72) has the same effect as performing auto maintenance.

Service

■AG-CPD15 Operating Time
Use this function to view the operating time of this unit.
(unit : H)

■FAN Operating Time
Use this function to view the operating time of the fan.
(unit : H)

■CAM1 Operating Time
Use this function to view the operating time of the Color Camera.
(unit : H)

■AG-RCP30 Operating Time
Use this function to view the operating time of the Remote Control Panel.
(unit : H)

■LCD Lighting Time
Use this function to view the cumulative lighting time of the LCD panel.
(unit : H)

■AG-CPD15 Version
Use this function to view the version of this unit.

■BIOS Creation Date
Use this function to view the BIOS creation date. (Month/Day/Year)

■Microcontroller Version
Use this function to view the version of the microprocessor.

■AG-RCP30 Version
Use this function to view the version of the Remote Control Panel.

Operations

■Version Up
For details on obtaining version upgrade files, consult your supplier. Make sure to use a computer beforehand to save the version upgrade file you obtain in the root directory* of a P2 card or USB memory device.

1. Insert the P2 card or connect the USB memory device to this unit.

2. Select [Service] - [Operations] - [Version Up], and press [PUSH ▶/II] to confirm the entry.
A confirmation dialog box appears.

3. Select "YES", and accept by pressing the [PUSH ▶/II] button.
The version upgrade is performed, and this unit automatically restarts.

Notes:
- Do not make button operations or turn the power off during a version upgrade.
- An error screen appears if the version upgrade fails. (see "Error messages" on pages 115, 116, 119)

* Version upgrade cannot be performed when the following conditions exist in the root directory.
  - If a DATA folder is present
  - If multiple version upgrade files (.VUP extension) are present

■Menu Copy

Use this function to copy menu settings from this recorder to another memory card recorder (referred to as “a second recorder” in this manual).

Operations on this recorder

1. Connect a USB memory device to this recorder.

The configuration file*1 cannot be output to a P2 card.

2. Select [Service] - [Operations] - [Menu Copy], and press [PUSH ▶/II] to confirm the entry.

A confirmation dialog box appears.

3. Select “Copy”, and accept by pressing the [PUSH ▶/II] button.

This creates a configuration file*1 in the root directory on the USB memory device.

Select “Cancel” to stop menu copy.

Operations on a second recorder

●Using a USB memory device

1. Connect the USB memory device to the second recorder.

2. Open the P2 card slot cover.

3. With the P2 card slot cover open, keep pressing the [REC] button on the second recorder until the [READY] or [BUSY] lamp starts to flash (about 10 seconds or more).

The configuration file*1 is loaded. Loading takes between 20 to 50 seconds. The [READY]*2 lamp lights when the file has been successfully loaded.

4. Press the [STOP] button.

The second recorder reboots and will now run using the same settings as this recorder.

∗1 The configuration file is the file with the “.CFG” extension. The configuration file contains all information set on this recorder excluding the following data.

- AG-CPD15 Operating Time
- FAN Operating Time
- CAM1 Operating Time
- AG-RCP30 Operating Time
- LCD Lighting Time
- AG-CPD15 Version
- BIOS Creation Date
- Microcontroller Version
- AG-RCP30 Version
- Last errors

∗2 The following lamp states indicate that an error has occurred.

[BUSY] lamp fast blinking:

This indicates that an error occurred during configuration file*1 check or administrator authentication.

- If a configuration file*1 check error occurred, the following are probable causes.
  - The configuration file is missing.
  - There are multiple configuration files.
  - The configuration file is corrupted.
- If an administrator authentication error occurred, administrator setup has been made on the second recorder. Use a PC to copy the administrator’s officer data to the \WIDKEY on the USB memory device. For details regarding text files containing administrator's officer data, see “Text Files Used with the Recorder” on pages 43 - 46. Then perform “Operations on a second recorder” starting from step 1 again.

[READY] lamp goes off:

This indicates that the data could not be correctly loaded. Perform the operations below in the stated order. If the [READY] lamp still does not light, consult your supplier.

① Remove the USB memory device and perform “Operations on a second recorder” starting from step 1.
② Replace the USB memory device and perform “Operations on a second recorder” starting from step 1.
③ Perform “Operations on this recorder” starting from step 1.

●Using a P2 card

1. Use a PC to copy the configuration file*1 created in step 3 of “Operations on this recorder” from the USB memory device to the root directory on a P2 card.

2. Open the P2 card slot on the second recorder and insert a P2 card in the slot1*2.

3. With the P2 card slot cover open, keep pressing the [REC] button on the second recorder until the [READY] or [BUSY] lamp starts to flash (about 10 seconds or more).

The configuration file*1 is loaded. Loading takes between 20 to 50 seconds. The [READY]*3 lamp lights when the file has been successfully loaded.

4. Press the [STOP] button.

The second recorder reboots and will now run using the same settings as this recorder.

*1 The configuration file is the file with the “.CFG” extension. The configuration file contains all information set on this recorder excluding the following data.
- AG-CPD15 Operating Time
- FAN Operating Time
- CAM1 Operating Time
- AG-RCP30 Operating Time
- LCD Lighting Time
- AG-CPD15 Version
- BIOS Creation Date
- Microcontroller Version
- AG-RCP30 Version
- Last errors

*2 Don’t insert a P2 card in the slot2 since the menu settings are not copied.

*3 The following lamp states indicate that an error has occurred.

[BUSY] lamp fast blinking:
This indicates that an error occurred during configuration file*1 check or administrator authentication.
- If a configuration file*1 check error occurred, the following are probable causes.
  - The configuration file is missing.
  - There are multiple configuration files.
  - The configuration file is corrupted.
- If an administrator authentication error occurred, administrator setup has been made on the second recorder. Use a PC to copy the administrator’s officer data to the \WIDKEY on the USB memory device. For details regarding text files containing administrator's officer data, see “Text Files Used with the Recorder” on pages 43 - 46. Connect the USB memory device to the second recorder and perform step 3 of “Operations on a second recorder” again.

[READY] lamp goes off:
This indicates that the data could not be correctly loaded. Perform the operations below in the stated order. If the [READY] lamp still does not light, consult your supplier.
① Perform “Operations on a second recorder” starting from step 1.
② Perform “Operations on this recorder” starting from step 1.

■Factory Default

All recorder settings* can be returned to their factory defaults.

> Note that the recorder will not revert to user made settings after being reset to their factory defaults. Make sure you really want to return all settings to their factory defaults before performing the following steps.

1. Select [Service] - [Operations] - [Factory Default], and press [PUSH ▶/II] to confirm the entry.

A confirmation dialog box appears.

2. Select "Exec", and accept by pressing the [PUSH ▶/II] button.

The recorder will reboot and start up in the factory default settings.
Select "Cancel" to cancel returning to the factory defaults.

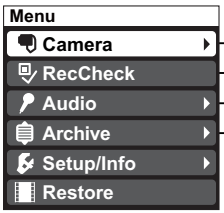
* The following settings do not return to their factory defaults.
  - AG-CPD15 Operating Time
  - FAN Operating Time
  - CAM1 Operating Time
  - AG-RCP30 Operating Time
  - LCD Lighting Time
  - AG-CPD15 Version
  - BIOS Creation Date
  - Microcontroller Version
  - AG-RCP30 Version

Menu List

Use menus provided by the Remote Control Panel to set up and adjust this unit.

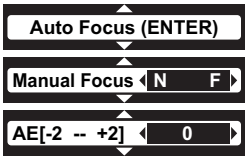
■When the [MENU] button is pressed while recording is being stopped in the live screen

• Menu top screen

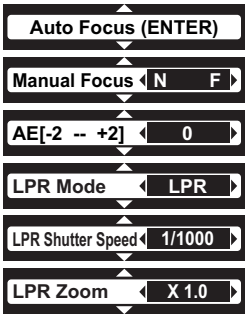


Camera (see pages 56 - 58)

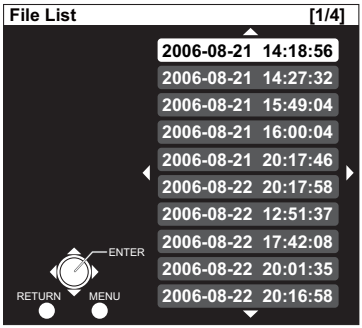
When [Init LPR Mode] is set to "DISABLE":



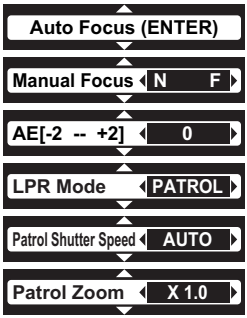
When [Init LPR Mode] is set to "ENABLE" and [LPR Mode] is set to "LPR":



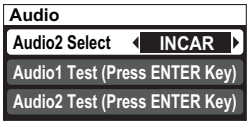
Archive (see page 68)



When [Init LPR Mode] is set to "ENABLE" and [LPR Mode] is set to "PATROL":



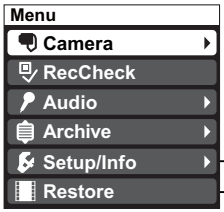
Audio (see page 59)



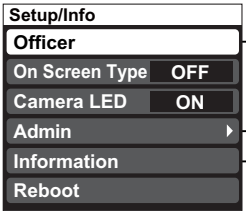
RecCheck (see page 64)
A trial shoot can be performed.

Menu List (continued)

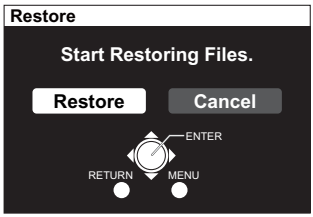
• **Menu top screen**



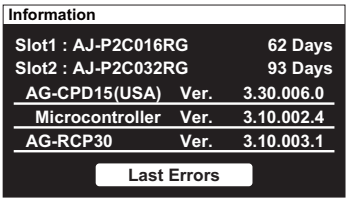
Setup/Info
(see pages 52, 53, 54, 59, 60, 72, 73)



Restore (see page 71)



Information (see page 72)



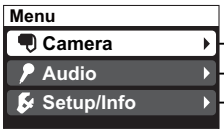
Admin (see pages 99 - 101)
The Setup/Admin top screen appears.
This opens a menu that only administrators can manipulate.

Officer (see page 98)
The Officer setup top screen appears.

Menu List (continued)

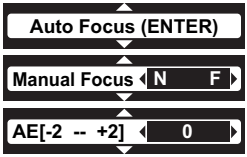
■When the [MENU] button is pressed while the live screen is being recorded

• Menu top screen

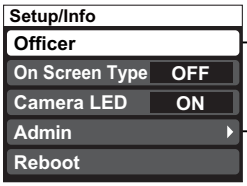


Camera (see pages 56 - 58)

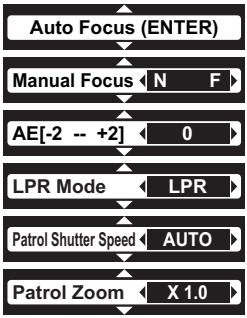
When [Init LPR Mode] is set to "DISABLE":



Setup/Info
(see pages 52, 53, 54, 59, 60, 72, 73)



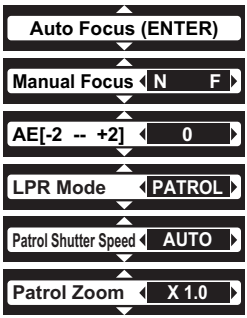
When [Init LPR Mode] is set to "ENABLE" and [LPR Mode] is set to "LPR":



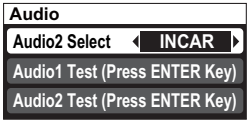
Admin (see pages 99 - 101)
The Setup/Admin top screen appears. This opens a menu that only administrators can manipulate.

Officer (see page 98)
The Officer setup top screen appears.

When [Init LPR Mode] is set to "ENABLE" and [LPR Mode] is set to "PATROL":



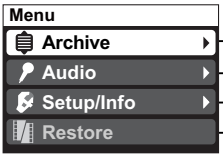
Audio (see page 59)



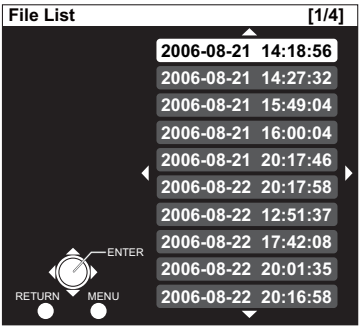
Menu List (continued)

■When the [MENU] button is pressed in the playback screen

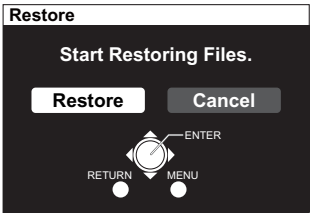
• Menu top screen



Archive (see page 68)

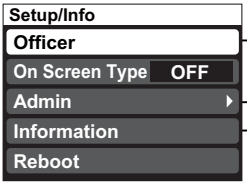


Restore (see page 71)



Audio (see page 68)

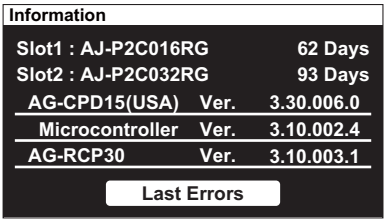
Setup/Info
(see pages 52, 53, 54, 72, 73)



Officer (see page 98)
The Officer setup top screen appears.

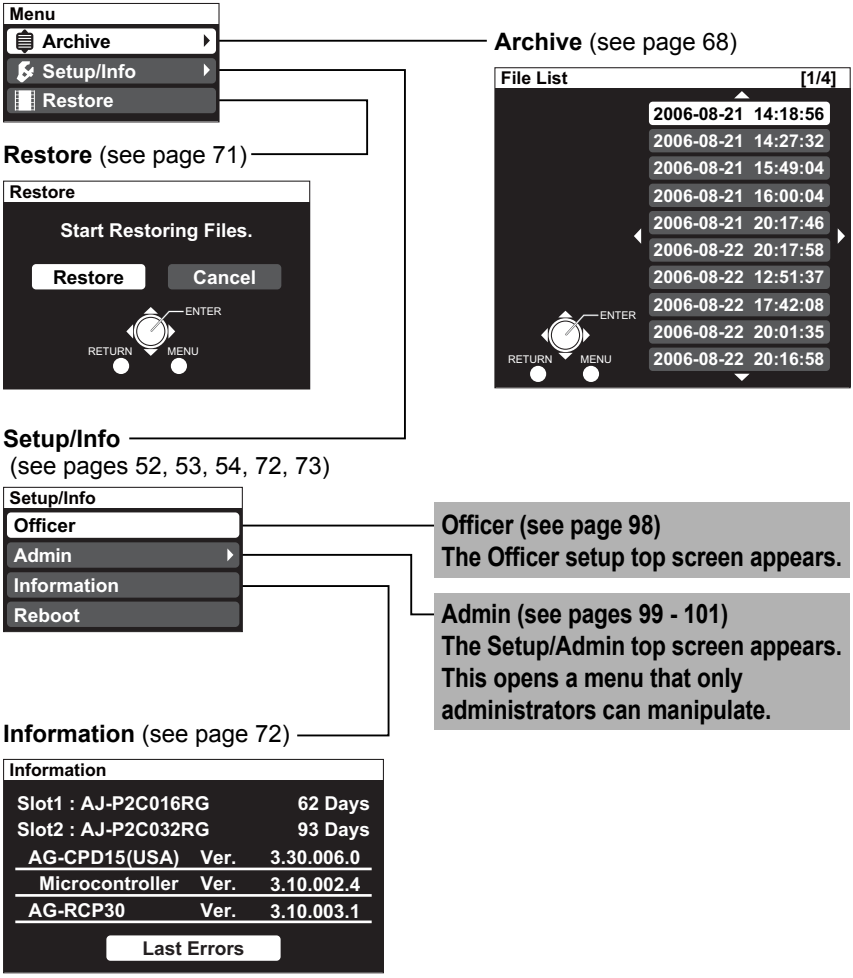
Admin (see pages 99 - 101)
The Setup/Admin top screen appears. This opens a menu that only administrators can manipulate.

Information (see page 72)



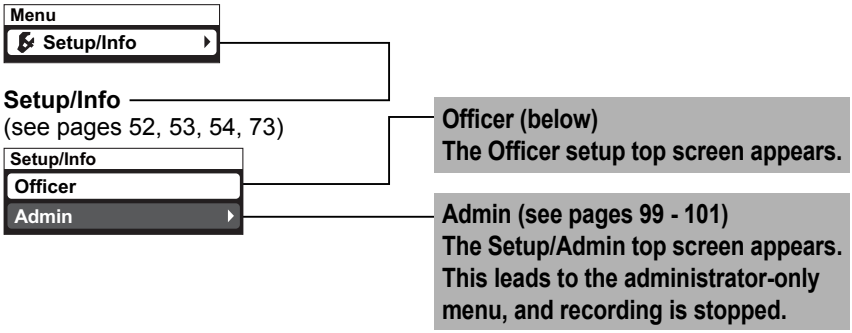
Menu List (continued)

■When the [MENU] button is pressed in the “Archive” screen, Officer Setup top screen, Setup/Admin top screen or during a “Restore” operation



Menu List (continued)

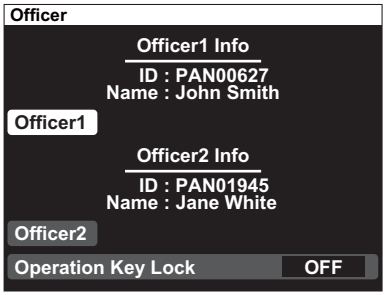
■When the [MENU] button is pressed in the Officer Setup top screen during recording



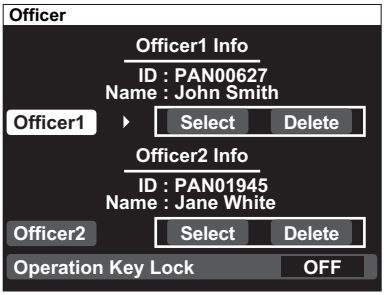
• **Officer setup top screen** (see pages 52 - 54)

There are three types of officer setup top screens; one for each officer setup method.

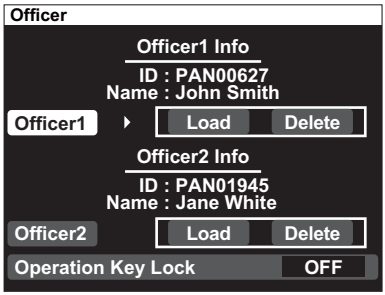
<AUTO>



<LIST>

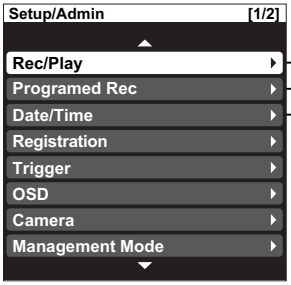


<MANUAL>

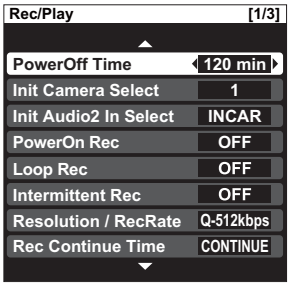


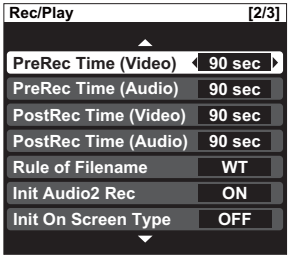
Menu List (continued)

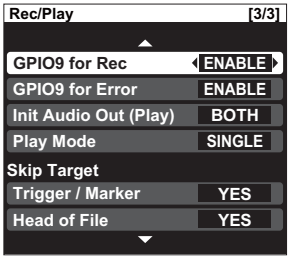
• **Setup/Admin top screen (1)-1**
(see pages 73, 74)



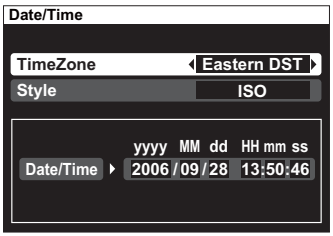
Rec/Play (see pages 75 - 78)



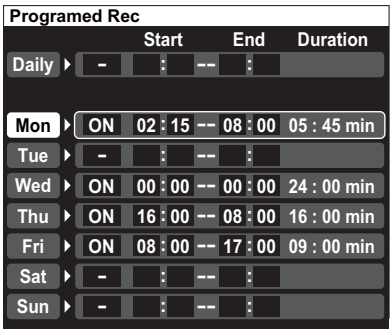

Rec/Play [2/3]
PreRec Time (Video) 90 sec
PreRec Time (Audio) 90 sec
PostRec Time (Video) 90 sec
PostRec Time (Audio) 90 sec
Rule of Filename WT
Init Audio2 Rec ON
Init On Screen Type OFF



Date/Time (see page 79)

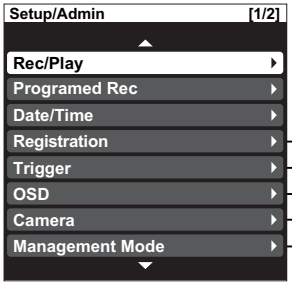


Programed Rec (see page 78)

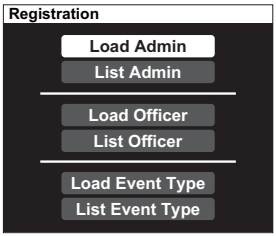

Programed Rec
Start End Duration
Daily - -- :
Mon ON 02 : 15 -- 08 : 00 05 : 45 min
Tue - -- :
Wed ON 00 : 00 -- 00 : 00 24 : 00 min
Thu ON 16 : 00 -- 08 : 00 16 : 00 min
Fri ON 08 : 00 -- 17 : 00 09 : 00 min
Sat - -- :
Sun - -- :

Menu List (continued)

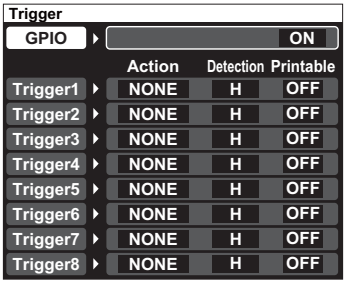
• **Setup/Admin top screen (1)-2**
(see pages 73, 74)



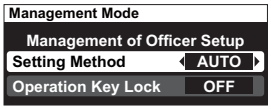
Registration (see page 79)



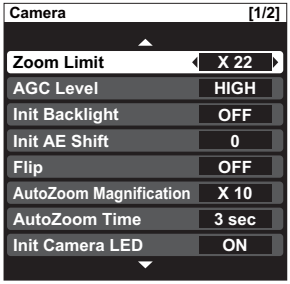
Trigger (see page 80)

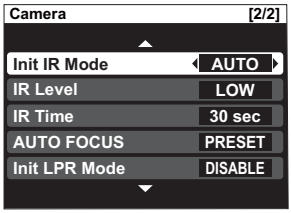


Management Mode (see page 83)

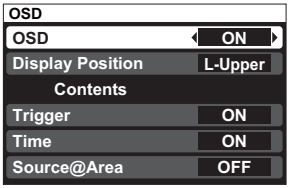


Camera (see pages 81, 82)





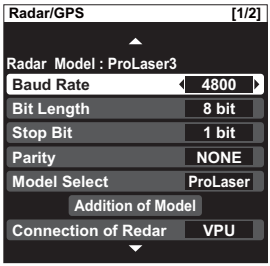
OSD (see pages 80, 81)

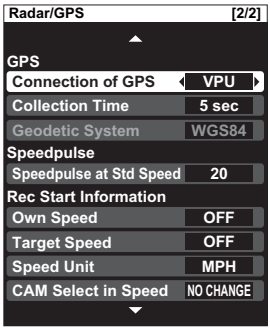


Menu List (continued)

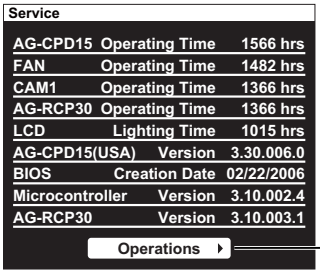
• **Setup/Admin top screen (2)**
(see pages 73, 74)

Radar/GPS (see pages 83 - 85)



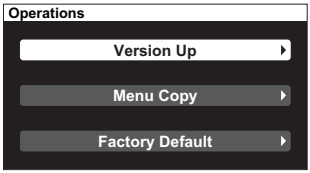


Service (see page 89)

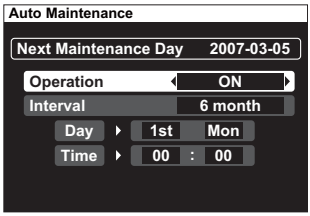


File Management
(see pages 85, 86)

Operations (see pages 89 - 92)



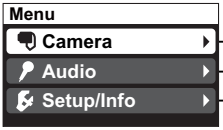
Auto Maintenance
(see pages 87, 88)



Menu List (continued)

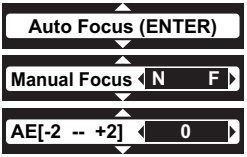
■When the [MENU] button is pressed while the PC application is running

• Menu top screen

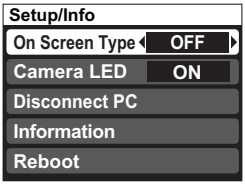


Camera (see pages 56 - 58)

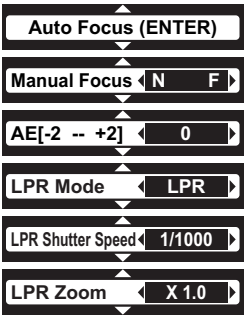
When [Init LPR Mode] is set to "DISABLE":



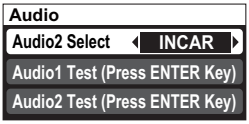
Setup/Info
(see pages 59, 60, 62, 69, 72)



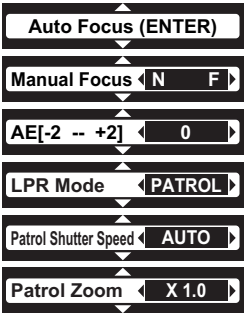
When [Init LPR Mode] is set to "ENABLE" and [LPR Mode] is set to "LPR":



Audio (see page 59)

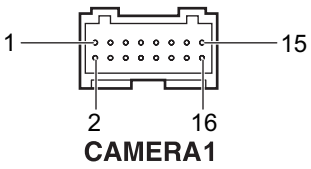


When [Init LPR Mode] is set to "ENABLE" and [LPR Mode] is set to "PATROL":



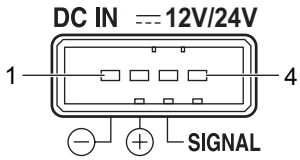
Connector Signals

[CAMERA1] connector (male)



Pin number	Signal
1	N.C.
2	GND (SHIELD)
3	V_OUT
4	GND (V_OUT)
5	BL_L
6	GND (TxD/RxD)
7	AUTO_ZOOM_L
8	TxD
9	REC_L
10	RxD
11	GND (DC_IN)
12	REC_LED_L
13	DC_IN
14	GND (SHIELD)
15	N.C.
16	GND (SHIELD)

[DC IN] connector (male)



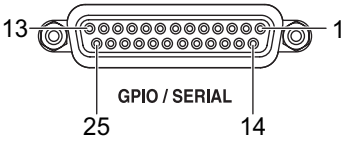
Pin number	Signal	Cable color
1	GND (⊖)	Black
2	BATT (⊕)	Red
3	SIGNAL*	White
4	N.C.	

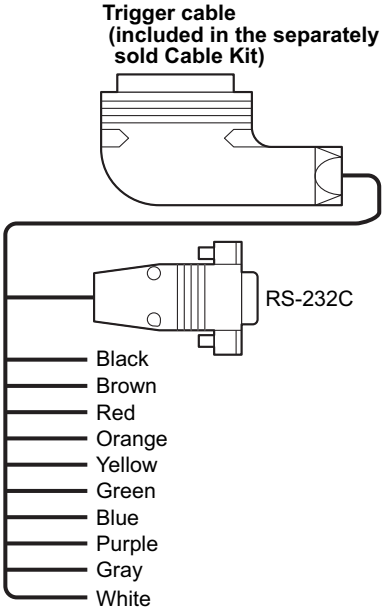
Power cable (included in the separately sold Cable Kit)

∗ Recorder power can be turned on and off by the SIGNAL port. If an OFF signal is input while the recorder is operating, the recorder turns off after the time specified on the Remote Control Panel.

Connector signals (continued)

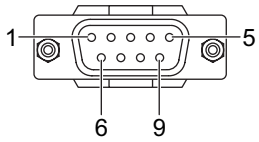
[GPIO/Serial] connector (female)





Pin number	Signal	Remarks	Cable color
1	N.C.		
2	TxD	Serial	
3	RxD	Serial	
4	RTS	Serial	
5	CTS	Serial	
6	DSR	Serial	
7	SG	Serial	
8	N.C.		
9	GND	GPIO	Black
10	GPIO1	In	Brown
11	GPIO2	In	Red
12	GPIO3	In	Orange
13	GPIO4	In	Yellow
14	N.C.		
15	N.C.		
16	N.C.		
17	N.C.		
18	N.C.		
19	N.C.		
20	DTR	Serial	
21	GPIO5	In	Green
22	GPIO6	In	Blue
23	GPIO7	In	Purple
24	GPIO8	In	Gray
25	GPIO9	Out	White

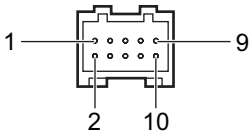
RS-232C connector (male)*1



Pin number	Signal
1	N.C.
2	RxD
3	TxD
4	DTR
5	SG
6	DSR
7[*2]	RTS
8[*2]	CTS
9	N.C.

∗1 Consult your supplier and request radar gun connection.
∗2 Pins 7 and 8 on this recorder are short-circuited.

[CONTROL PANEL] connector (male)



CONTROL PANEL

Pin number	Signal
1	N.C.
2	N.C.
3	DC_IN
4	GND (DC_IN)
5	SOUT_P
6	SOUT_N
7	SIN_P
8	SIN_N
9	GND (DIGITAL)
10	GND (FG)

Vehicle Speed Pulse Setting Table (at 40 mph)

Outside Diameter of Tire (inch)	Pulses Per Tire Revolution											
	2	3	4	5	6	7	8	9	10	11	12	13
15	30	45	60	75	90	105	120	134	149	164	179	194
16	28	42	56	70	84	98	112	126	140	154	168	182
17	26	40	53	66	79	92	105	119	132	145	158	171
18	25	37	50	62	75	87	100	112	124	137	149	162
19	24	35	47	59	71	83	94	106	118	130	142	153
20	22	34	45	56	67	78	90	101	112	123	134	146
21	21	32	43	53	64	75	85	96	107	117	128	139
22	20	31	41	51	61	71	81	92	102	112	122	132
23	19	29	39	49	58	68	78	88	97	107	117	127
24	19	28	37	47	56	65	75	84	93	103	112	121
25	18	27	36	45	54	63	72	81	90	99	108	117
26	17	26	34	43	52	60	69	78	86	95	103	112
27	17	25	33	41	50	58	66	75	83	91	100	108
28	16	24	32	40	48	56	64	72	80	88	96	104
29	15	23	31	39	46	54	62	70	77	85	93	100
30	15	22	30	37	45	52	60	67	75	82	90	97
31	14	22	29	36	43	51	58	65	72	80	87	94
32	14	21	28	35	42	49	56	63	70	77	84	91
33	14	20	27	34	41	48	54	61	68	75	81	88
34	13	20	26	33	40	46	53	59	66	72	79	86
35	13	19	26	32	38	45	51	58	64	70	77	83
36	12	19	25	31	37	44	50	56	62	68	75	81
37	12	18	24	30	36	42	48	55	61	67	73	79
38	12	18	24	29	35	41	47	53	59	65	71	77
39	11	17	23	29	34	40	46	52	57	63	69	75
40	11	17	22	28	34	39	45	50	56	62	67	73
41	11	16	22	27	33	38	44	49	55	60	66	71
42	11	16	21	27	32	37	43	48	53	59	64	69
43	10	16	21	26	31	36	42	47	52	57	63	68
44	10	15	20	25	31	36	41	46	51	56	61	66
45	10	15	20	25	30	35	40	45	50	55	60	65
46	10	15	19	24	29	34	39	44	49	54	58	63
47	10	14	19	24	29	33	38	43	48	52	57	62
48	9	14	19	23	28	33	37	42	47	51	56	61
49	9	14	18	23	27	32	37	41	46	50	55	59
50	9	13	18	22	27	31	36	40	45	49	54	58

Vehicle Speed Pulse Setting Table (at 40 mph) (continued)

Outside Diameter of Tire (inch)	Pulses Per Tire Revolution											
	14	15	16	17	18	19	20	21	22	23	24	25
15	209	224	239	254	269	284	299	314	329	344	359	373
16	196	210	224	238	252	266	280	294	308	322	336	350
17	185	198	211	224	237	250	264	277	290	303	316	330
18	174	187	199	212	224	237	249	261	274	286	299	311
19	165	177	189	201	212	224	236	248	259	271	283	295
20	157	168	179	190	202	213	224	235	246	258	269	280
21	149	160	171	181	192	203	213	224	235	245	256	267
22	143	153	163	173	183	194	204	214	224	234	244	255
23	136	146	156	166	175	185	195	205	214	224	234	244
24	131	140	149	159	168	177	187	196	205	215	224	233
25	125	134	143	152	161	170	179	188	197	206	215	224
26	121	129	138	147	155	164	172	181	190	198	207	215
27	116	124	133	141	149	158	166	174	183	191	199	207
28	112	120	128	136	144	152	160	168	176	184	192	200
29	108	116	124	131	139	147	155	162	170	178	185	193
30	105	112	120	127	134	142	149	157	164	172	179	187
31	101	108	116	123	130	137	145	152	159	166	173	181
32	98	105	112	119	126	133	140	147	154	161	168	175
33	95	102	109	115	122	129	136	143	149	156	163	170
34	92	99	105	112	119	125	132	138	145	152	158	165
35	90	96	102	109	115	122	128	134	141	147	154	160
36	87	93	100	106	112	118	124	131	137	143	149	156
37	85	91	97	103	109	115	121	127	133	139	145	151
38	83	88	94	100	106	112	118	124	130	136	142	147
39	80	86	92	98	103	109	115	121	126	132	138	144
40	78	84	90	95	101	106	112	118	123	129	134	140
41	77	82	87	93	98	104	109	115	120	126	131	137
42	75	80	85	91	96	101	107	112	117	123	128	133
43	73	78	83	89	94	99	104	109	115	120	125	130
44	71	76	81	87	92	97	102	107	112	117	122	127
45	70	75	80	85	90	95	100	105	110	115	120	124
46	68	73	78	83	88	93	97	102	107	112	117	122
47	67	72	76	81	86	91	95	100	105	110	114	119
48	65	70	75	79	84	89	93	98	103	107	112	117
49	64	69	73	78	82	87	91	96	101	105	110	114
50	63	67	72	76	81	85	90	94	99	103	108	112

Vehicle Speed Pulse Setting Table (at 60 kph)

Outside Diameter of Tire (mm)	Pulses Per Tire Revolution											
	2	3	4	5	6	7	8	9	10	11	12	13
400	27	40	53	66	80	93	106	119	133	146	159	172
420	25	38	51	63	76	88	101	114	126	139	152	164
440	24	36	48	60	72	84	96	109	121	133	145	157
460	23	35	46	58	69	81	92	104	115	127	138	150
480	22	33	44	55	66	77	88	99	111	122	133	144
500	21	32	42	53	64	74	85	95	106	117	127	138
520	20	31	41	51	61	71	82	92	102	112	122	133
540	20	29	39	49	59	69	79	88	98	108	118	128
560	19	28	38	47	57	66	76	85	95	104	114	123
580	18	27	37	46	55	64	73	82	91	101	110	119
600	18	27	35	44	53	62	71	80	88	97	106	115
620	17	26	34	43	51	60	68	77	86	94	103	111
640	17	25	33	41	50	58	66	75	83	91	99	108
660	16	24	32	40	48	56	64	72	80	88	96	104
680	16	23	31	39	47	55	62	70	78	86	94	101
700	15	23	30	38	45	53	61	68	76	83	91	99
720	15	22	29	37	44	52	59	66	74	81	88	96
740	14	22	29	36	43	50	57	65	72	79	86	93
760	14	21	28	35	42	49	56	63	70	77	84	91
780	14	20	27	34	41	48	54	61	68	75	82	88
800	13	20	27	33	40	46	53	60	66	73	80	86
820	13	19	26	32	39	45	52	58	65	71	78	84
840	13	19	25	32	38	44	51	57	63	69	76	82
860	12	19	25	31	37	43	49	56	62	68	74	80
880	12	18	24	30	36	42	48	54	60	66	72	78
900	12	18	24	29	35	41	47	53	59	65	71	77
920	12	17	23	29	35	40	46	52	58	63	69	75
940	11	17	23	28	34	40	45	51	56	62	68	73
960	11	17	22	28	33	39	44	50	55	61	66	72
980	11	16	22	27	32	38	43	49	54	60	65	70
1000	11	16	21	27	32	37	42	48	53	58	64	69
1020	10	16	21	26	31	36	42	47	52	57	62	68
1040	10	15	20	26	31	36	41	46	51	56	61	66
1060	10	15	20	25	30	35	40	45	50	55	60	65
1080	10	15	20	25	29	34	39	44	49	54	59	64
1100	10	14	19	24	29	34	39	43	48	53	58	63
1120	9	14	19	24	28	33	38	43	47	52	57	62
1140	9	14	19	23	28	33	37	42	47	51	56	60
1160	9	14	18	23	27	32	37	41	46	50	55	59
1180	9	13	18	22	27	31	36	40	45	49	54	58
1200	9	13	18	22	27	31	35	40	44	49	53	57

Vehicle Speed Pulse Setting Table (at 60 kph) (continued)

Outside Diameter of Tire (mm)	Pulses Per Tire Revolution											
	14	15	16	17	18	19	20	21	22	23	24	25
400	186	199	212	225	239	252	265	279	292	305	318	332
420	177	189	202	215	227	240	253	265	278	291	303	316
440	169	181	193	205	217	229	241	253	265	277	289	301
460	161	173	185	196	208	219	231	242	254	265	277	288
480	155	166	177	188	199	210	221	232	243	254	265	276
500	149	159	170	180	191	202	212	223	233	244	255	265
520	143	153	163	173	184	194	204	214	224	235	245	255
540	138	147	157	167	177	187	196	206	216	226	236	246
560	133	142	152	161	171	180	189	199	208	218	227	237
580	128	137	146	155	165	174	183	192	201	210	220	229
600	124	133	141	150	159	168	177	186	195	203	212	221
620	120	128	137	145	154	163	171	180	188	197	205	214
640	116	124	133	141	149	157	166	174	182	191	199	207
660	113	121	129	137	145	153	161	169	177	185	193	201
680	109	117	125	133	140	148	156	164	172	179	187	195
700	106	114	121	129	136	144	152	159	167	174	182	189
720	103	111	118	125	133	140	147	155	162	169	177	184
740	100	108	115	122	129	136	143	151	158	165	172	179
760	98	105	112	119	126	133	140	147	154	161	168	175
780	95	102	109	116	122	129	136	143	150	156	163	170
800	93	99	106	113	119	126	133	139	146	153	159	166
820	91	97	104	110	116	123	129	136	142	149	155	162
840	88	95	101	107	114	120	126	133	139	145	152	158
860	86	93	99	105	111	117	123	130	136	142	148	154
880	84	90	96	102	109	115	121	127	133	139	145	151
900	83	88	94	100	106	112	118	124	130	136	141	147
920	81	86	92	98	104	110	115	121	127	133	138	144
940	79	85	90	96	102	107	113	119	124	130	135	141
960	77	83	88	94	99	105	111	116	122	127	133	138
980	76	81	87	92	97	103	108	114	119	125	130	135
1000	74	80	85	90	95	101	106	111	117	122	127	133
1020	73	78	83	88	94	99	104	109	114	120	125	130
1040	71	77	82	87	92	97	102	107	112	117	122	128
1060	70	75	80	85	90	95	100	105	110	115	120	125
1080	69	74	79	84	88	93	98	103	108	113	118	123
1100	68	72	77	82	87	92	96	101	106	111	116	121
1120	66	71	76	81	85	90	95	99	104	109	114	118
1140	65	70	74	79	84	88	93	98	102	107	112	116
1160	64	69	73	78	82	87	91	96	101	105	110	114
1180	63	67	72	76	81	85	90	94	99	103	108	112
1200	62	66	71	75	80	84	88	93	97	102	106	111

Indicator Lamps and Recorder Status

This table shows the relationship between lamp Lit/Unlit/blinking states and the recorder's operating status.
● : Lit ◐ : Normal blinking ○ : Unlit ◌ : Fast blinking (about three times/sec)
◔ : Blinking consisting of short off intervals combined with long on intervals

Indicator Lamp			Recorder Status
REC (Red)	READY (Green)	BUSY (Red)	
◐	◐	◐	Status immediately after power-on
○	◐	◐	Recorder booting
○	●	○	Live video display*1
●	●	●	Normal recording*1, *2
◔	●	●	Intermittent recording*1, *2
○	●	●	• Postrecording*1 • Including PC application operation*3
○	◐	○	Administrator setting screen display with recording stopped (not accessing P2 card)
○	◐	●	Administrator setting screen display with recording stopped (accessing P2 card)
○	○	●	Playing
○	○	◐	• Terminating operation • P2 card start processing (recognition when inserted) • P2 card shutdown processing (when a P2 card slot cover is opened)
●	◐	●	Updating recorder firmware
◐	●	●	• Updating microprocessors on the recorder and Remote Control Panel • Copying menu settings
◐	●	◐	Successfully copied the menu settings
◐	○	◐	Failed to copy menu settings
◌	●, ◐ or ○		An error involving recording operations occurred during live screen display*4
○	○	○	• The recorder's P2 card slot cover is open • No P2 card is inserted, or it is not recognized • No more P2 card space available • The write-protect switch of the P2 card is set to "PROTECT" <When using 16 GB or higher capacity P2 cards> • A new unformatted card • When the maximum number of recording days or files has been exceeded • When P2 card folders have been manipulated on a PC

Indicator Lamps and Recorder Status (continued)

∗1 Inserting a P2 card that displays a “RUNDOWN” On Screen status display (see “Viewing Live Video → Viewing the status of this unit” on pages 60, 61) will cause the [READY] lamp to blink.

∗2 The [REC] lamp normally blinks under the following conditions:

- When there is little space left (about 30 minutes or less) on a P2 card
- When the number of files recorded on the P2 cards inserted in slots 1 and 2 totals over 19,000 (up to 20,000) files
- When the maximum number of recording files per day approaches (depends on format type). See “Format” on page 86 for details.
- When the remaining recording days is less than 5% of the total recording days of all P2 cards inserted in P2 card slots 1 and 2.

∗3 For details on how to run the PC application, refer to the operating instructions supplied with the PC application.

∗4 If the error is related to the status of the P2 card, the status will appear in the status display of the On-Screen. Refer to “Viewing Live Video → Viewing the status of this unit” on pages 60 and 61, or contact your supplier.

Notes:

- If pressing the [REC] button or entering a recording trigger fails to start recording, the [REC] lamp blinks at a high rate.
- The [BUSY] lamp blinks when accessing the P2 card immediately after opening or closing the recorder’s P2 card slot cover.

Troubleshooting

Before requesting service, check the points listed below. If the problem persists, contact your supplier.

■Starting up

Symptom	Remedy
Power does not come on.	• Check whether power cable (included in the separately sold Cable Kit) is connected correctly.
Power gets turned off automatically.	• If you have set a refer to “PowerOff Time” on page 75 and are running the recorder with the ignition switch at LOCK (OFF), turn the ignition switch on and reboot the recorder (see “On” on page 19). • If the operating environment is hotter than the recommended temperature, the unit may turn off for safety reasons. If this happens, wait for the operating environment to cool down before using the unit.

■Operation

Symptom	Remedy
Cover cannot be opened.	• Are you using the supplied key?
Key cannot be removed from lock.	• Is the P2 card slot cover closed? The key can only be removed if the P2 card slot cover is closed.
P2 card slot cover cannot be closed.	• Is a P2 card inserted correctly in a P2 card slot? • Is the Eject button folded to the right?
The unit does not respond or another problem has occurred.	• To reset the unit, keep pressing the [REC] button and [STOP] button on this unit together for about 10 seconds. When resetting, after all lamps turn off (1 or 2 seconds) and then on (1 or 2 seconds), all lamps blink. • If the button lock is enabled (“ON”), change the setting to “OFF”. (see “Unlocking” on page 54 and “Operation Key Lock” on page 83)
Recorder was restarted without performing a reset.	• If you remove the P2 card during P2 card access ([BUSY] lamp is lit), the P2 card slot may become inoperative. In such a case, the recorder automatically restarts itself, and the card slot will become operative again. • When auto maintenance is set to “ON”, the recorder reboots at the set interval.

■Recording

Symptom	Remedy
Cannot start recording. Or a recording error warning appears.	• Is a P2 card inserted in a P2 card slot? • Is the P2 card slot cover closed? • Is there any free space on the P2 card? Check the remaining space, and upload files to clear some space. • Make sure that the write-protect switch of the P2 card is not set to PROTECT. • Check if a 16 GB or higher capacity P2 card was formatted in this unit. A 16 GB or higher capacity P2 card whose folders have been modified on a PC must be reformatted in this unit. • Are the [GPIO/SERIAL] connector or recording trigger criteria set correctly? • Check whether the recorder is set to administrator setup status. • Check whether the correct cables have been connected to the video input connectors.
Recorded data have become totally or partially unusable.	• A power outage or power cable (included in the separately sold Cable Kit) disconnection during recording may damage the P2 card or corrupt data on a P2 card. Never turn the power off while recording to a P2 card. • Do not insert or remove a P2 card when another P2 card is being accessed as this may damage the P2 card or corrupt data on the P2 card. • Corrupted data may be restorable (see “Restoring Files” on page 71 for details).

Troubleshooting (continued)

Symptom	Remedy
Video is distorted or not recorded.	• Are Color Camera and video monitoring equipment connected properly? • Are both the video input connector selection and the input selection made with the Remote Control Panel the same? • Are the video outputs settings correct for the connected equipment? Connect a monitor to the [VIDEO OUT] connector on the rear panel of the Memory Card Video Recorder and check the picture.
Sound is distorted or not recorded.	• Is the cable connection to the audio input correct? • Are both the audio input connector selection and the input selection made with the Remote Control Panel the same? • Are the audio outputs settings correct for the connected equipment? Refer to the Operating Instructions for the connected device.
Information from equipment connected via the [GPIO/ SERIAL] connector is not recorded in the meta data file.	• Do the communications settings of the connected device match those of the recorder's [GPIO / SERIAL] connector? Check this while referring to the Operating Instructions for connected equipment.

Error Messages

No.	Message	Measure
E00411 E00418 E00461 E00468	Update file not found.	No update file could be found on the P2 card or USB memory device. • Check whether the update file for this unit has been correctly copied to the P2 card or USB memory device. • Reformat the P2 card or USB memory device before use. • Use another USB memory device.
E00410 E00413 E00414 E00415 E00460 E00463 E00464 E00465	Invalid update file found.	The update file on the P2 card or USB memory device is corrupted. • Check whether the update file for this unit has been correctly copied to the P2 card or USB memory device. • Reformat the P2 card or USB memory device before use. • Use another USB memory device.
E00412 E00462	More than two update files found.	Multiple update files were found on the P2 card or USB memory device. • Check whether there are multiple update files on the P2 card or USB memory device. • Check whether there are multiple P2 cards and/or USB memory devices containing update files.
E00419 E00469	This media cannot use for update.	The used P2 card or USB memory device cannot be used for updating. • A P2 card with a \DATA folder cannot be used for updating. • A USB memory device containing a folder other than the \WIDKEY folder cannot be used for updating.
E00420 E00470	Update file read error.	An update file load error occurred. • Check whether the update file for this unit has been correctly copied to the P2 card or USB memory device. • Reformat the P2 card or USB memory device before use. • Use another USB memory device.

Error messages (continued)

No.	Message	Measure
E00449	Unexpected update failure.	Some other update error occurred. • Check whether the update file for this unit has been correctly copied to the P2 card or USB memory device. • Reformat the P2 card or USB memory device before use. • Use another USB memory device.
E00466		
E00467		
E00499		
E00602	AG-RCP30 needs to be updated! Will start updating soon.	A connected AG-RCP30 was found to need an update. This unit reboots automatically to start an update.
E00603	Unsupported Control Panel! Replace Control Panel.	A Remote Control Panel not supported by this unit was detected. Disconnect the Remote Control Panel.
E00604	ACC Off detected ! Will power off after uploading. Turn ACC ON to cancel power off.	The vehicle engine switch is set to LOCK (OFF) when “PowerOff Time” on page 75 is set to “AUTO”. The system awaits control from a PC application to be released. To continue using the recorder without turning it off, set the engine switch to ON.
E02431	DSP error. Playback and record cannot be performed.	Wait until the error message is cleared. Contact your supplier if the message does not clear after about a minute.
E02432		
E02440	System error Couldn’t format P2 cards.	Insert another P2 card.
E02441	Couldn’t format P2 cards.	
E02442	Found read only P2 cards. Couldn’t format.	Disable P2 card write-protection.
E02443	Not P2 card. Couldn’t format.	The inserted card is not a P2 card. Replace the card with a P2 card.
E02444	No card. Couldn’t format.	Insert a P2 card.
E02460	System error Couldn’t delete files.	Contact your supplier.

Error messages (continued)

No.	Message	Measure
E02461	Couldn't delete files.	Check the card information, and proceed as follows according to the information. **CARD PROTECT:** Release the write-protect switch of the P2 card. **UNFORMATTED:** Replace with the formatted P2 card. **REFORMAT:** Upload or export data to back it up and reformat the card. **NO CARD:** Insert a P2 card. **Others:** Replace the P2 card with another one.
E02470	System error Couldn't restore files.	Contact your supplier.
E02471	Couldn't restore files.	
E02481	Write error on slot1. Record cannot be continued.	Be sure to use the correct procedure to remove and load P2 cards. Replace a P2 card that is not recognized after inserting it in the P2 card slot and closing the P2 card slot cover.
E02482	Write error on slot2. Record cannot be continued.	
E07671	Camera communication error. Camera cannot be controlled.	The Color Camera may not be correctly connected. Check whether the camera cable (included in the Color Camera) is correctly connected to the Color Camera. Contact your supplier if this measure does not solve the problem.
E08601	Lid open. Playback and record cannot be performed.	Close the P2 card slot cover.
E08602	The recorder's fan has stopped.	Contact your supplier.
E10400	Radar model file not found.	
E10401	More than five radar model files found.	
E10402	Invalid radar model file found.	
E10403	Radar model file read error.	
E10410	Radar communication error. Please check the radar setting.	
E15751	Card is run-down. Replace P2 card on slot1.	A P2 card is nearing the end of its service life. While it will still be possible to record and play back a P2 card after this message has appeared, you are recommended to replace it.
E15752	Card is run-down. Replace P2 card on slot2.	

Error messages (continued)

No.	Message	Measure
E15753	Altered P2 Card found on slot1. Backup data and reformat.	P2 card data has been modified on another device. Upload or export data to back it up and reformat the card.
E15754	Altered P2 Card found on slot2. Backup data and reformat.	
E15755	VUP Card found on slot1. Record cannot be started.	The P2 card contains an update file. Insert a P2 card other than the one containing the update file.
E15756	VUP Card found on slot2. Record cannot be started.	
E15757	Illegal Card found on slot1. Record cannot be started.	The inserted card cannot be used. Check card type.
E15758	Illegal Card found on slot2. Record cannot be started.	
E15759	Unformatted Card found on slot1. Record cannot be started.	An unformatted P2 card has been inserted. Replace it with a formatted P2 card.
E15760	Unformatted Card found on slot2. Record cannot be started.	
E15761	Write Protect Card found on slot1. Record cannot be started.	The write-protection switch on the P2 card is set to the “PROTECT” position. Slide the write-protection switch away from the “PROTECT” position.
E15762	Write Protect Card found on slot2. Record cannot be started.	
E15763	No Card. Record cannot be started.	No P2 card is inserted. Insert a P2 card.
E15764	Write Error. Record cannot be started.	The P2 card cannot be written to. Replace the P2 card.
E15765	Card Full. Record cannot be started.	**8 GB or lower capacity P2 cards:** The following conditions may have occurred. • There is no space left on the P2 card. • The P2 cards inserted in P2 card slots 1 and 2 contain 20,000 or more files. Replace the P2 card with a P2 card with free capacity, or free up space in the P2 card for new data. **16 GB or higher capacity P2 cards:** The following conditions may have occurred. • There is no space left on the P2 card. • The P2 cards inserted in P2 card slots 1 and 2 contain 20,000 or more files. • The maximum number of files that can be recorded has been exceeded for that day. • The number of recording days has been exceeded Replace the P2 card with a P2 card with free capacity, or back up the data on the P2 card and reformat it.

Error messages (continued)

No.	Message	Measure
E20801	The recorder reboots by unrecoverable card ejection error.	Be sure to use the correct procedure to remove and load P2 cards.
E20802	The recorder reboots by unrecoverable card insertion error.	
E20803	Card is not ready. Please try to reinsert the card, or Reboot from Menu.	Check the P2 card and re-insert it, or reboot this unit.
E20901	Firmware Update FAILED!	An error occurred during the update. • Check whether the update file for this unit has been correctly copied to the P2 card or USB memory device. • Reformat the P2 card or USB memory device before use. • Use another USB memory device. • Check whether there are multiple update files on the P2 card or USB memory device. • Check whether there are multiple P2 cards and/or USB memory devices containing update files. • A P2 card with a \DATA folder cannot be used for updating. • A USB memory device containing a folder other than the \WIDKEY folder cannot be used for updating.
E20911	Microcontroller Update FAILED!	An error occurred during the update. This unit reboots automatically to restart an update. Contact your supplier if the problem persists.
E20912	Unsupported Microcontroller Detected!	This unit has broken down. Contact your supplier.
E20921	AG-RCP30 Update FAILED!	An error occurred during an update of an AG-RCP30 connected to this unit. This unit reboots automatically to restart an update. Contact your supplier if the problem persists.

Error messages (continued)

No.	Message	Measure
E20922	Unsupported Control Panel Detected!	A Remote Control Panel not supported by this unit was detected. Disconnect the Remote Control Panel.
E22420	Officer's information file cannot be loaded.	The officer data file (WID*****.TXT) is corrupted. Create a new officer's data file, save it to a USB memory device and re-register it.
E22421	Since you are not an administrator, you cannot open this menu.	You are not registered as an administrator and cannot open this menu. Ask a registered administrator for assistance.
E22422	Officer's information file cannot be loaded.	There is no Officer Registration file or it contains the wrong data. Create a correct Officer Registration file (WOFFICER.TXT), copy it to a USB memory device and reload it.
E22423	Admin's information file cannot be loaded.	There is no Administrator Registration file or it contains the wrong data. Create a correct Administrator Registration file (WADMIN.TXT), copy it to a USB memory device and reload it.
E22424	Officer's information cannot be setup during record !	Officer data cannot be changed during recording. Stop recording and start over.
E22425	Cannot load Event Type.	There is no event type file or the content of the file is incorrect. Copy the correct event type file (EVTYPE.TXT) to the USB memory device and reregister it.
E22426	Menu copy failure.	Connect a write-enabled USB memory device.
E22620	Auto Maintenance Canceled	Auto maintenance was not performed because the P2 card slot cover was open or because recording was in progress.
E25410	GPS communication error. Please check the GPS module.	An error occurred in the GPS module. Consult your supplier.
E28201	A capacity of USB strage is not enough to export.	Use other USB memory device that is not full.
E28202	Export is complete. Restore file remained.	Restore the file not yet restored, and export it again.
E28203	File not found in P2 cards.	There are no files to export. No export operation needed.
E28400	No USB storage devices. Couldn't start export.	Connect a USB memory device.
E28401	Found read only P2 cards. Couldn't start export.	Set the P2 card write-protect switch away from the write-protect position.

Error messages (continued)

No.	Message	Measure
E28402	All USB storages are read only. Couldn't start export.	Connect a write-enabled USB memory device.
E28403	Media error. Export is incomplete.	Replace the P2 card or the USB memory device.
E28404	USB storage file system error. Couldn't start export.	Replace the USB memory device.
E28405	USB storage write error. Export is incomplete.	
E28406	Found update file in USB storages. Couldn't start export.	Delete the update file on the USB memory device.
E28407	No P2 cards. Couldn't start export.	Insert a P2 card with recorded files.
E28408	Found unformatted P2 cards. Couldn't start export.	Insert a formatted P2 card with data stored on it.
E28409	Couldn't start export.	Replace the P2 card with another one.
E28499	System error. Export is incomplete.	Reboot this unit.
E28880	USB storage was ejected. Export is incomplete.	Do not remove the USB memory device while exporting data. Reconnect the USB memory device and export again.
E28881	USB storage was inserted. Export is incomplete.	Export the data again.

Status Display

The Status Display shows messages about the operating status of the P2 card and this unit. Take action as appropriate for each status.

Status Display	Measure
CARD FULL	**8 GB or lower capacity P2 cards:** The following conditions may have occurred. • There is no space left on the P2 card. • The P2 cards inserted in P2 card slots 1 and 2 contain 20,000 or more files. Replace the P2 card with a P2 card with free capacity, or free up space in the P2 card for new data. **16 GB or higher capacity P2 cards:** The following conditions may have occurred. • There is no space left on the P2 card. • The P2 cards inserted in P2 card slots 1 and 2 contain 20,000 or more files. • The maximum number of files that can be recorded has been exceeded for that day. • The number of recording days has been exceeded Replace the P2 card with a P2 card with free capacity, or back up the data on the P2 card and reformat it.
CARD PROTECT	The write-protect switch of the P2 card is set to “PROTECT”. Move the switch to enable writing.
VUP CARD	Writing is not possible on a P2 card intended for version upgrade. Replace the card with one that is not intended for version upgrade.
UNFORMATTED	The P2 card is not formatted. Replace it with a formatted card.
REFORMAT	P2 card data has been modified on another device. Upload or export data to back it up and reformat the card.
RUNDOWN	A P2 card is nearing the end of its service life. While it will still be possible to record and play back a P2 card after this message has appeared, you are recommended to replace it.
ILLEGAL CARD	• An unusable card is inserted. Check the type of card. • The inserted P2 card cannot be recognized. Replace it with a compatible card. • The P2 card is not inserted correctly. Remove and re-insert the card correctly.
NO CARD	No P2 card is inserted. Insert a P2 card.
READ ERROR	An error occurred while reading. File playback is not possible, or the associated meta information cannot be displayed correctly.
META ERROR	No associated meta information file exists. The information cannot be displayed.
PLAY ERROR	A decoder malfunction occurred. Playback is not available. Reboot this unit.

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Specifications

Power requirements:
12 V DC / 24 V DC
Input current: 2.1 A (at 12 V DC)
1.1 A (at 24 V DC)
Current consumption in standby:
1 mA (12 V DC/24 V DC)

▭ indicates a safety related item.

Operating temperature:
0 °C to 45 °C (32 °F to 113 °F)
Operating humidity:
10 % to 80 % (no condensation)
Weight
1070 g (2.36 lb)

Dimensions (W x H x D)
(excluding protrusions and recorder mounting brackets)
178 mm x 50 mm x 155 mm
(7 inches x 1-31/32 inches x 6-3/32 inches)
Video format:
NTSC (525 lines, 60 fields)
Recording media:
P2 card
Recording format:
Proprietary format
Video compression:
MPEG4
Audio compression:
G.726 2-channel

Recording time:

Card model number	Capacity	Recording bit rate (bps)	Number of cards	Recording time (hours)	Recording time of intermittent recording (hours)
AJ-P2C002SG	2 GB	Q-512k	1	approx.8	approx.34
			2	approx.16	approx.68
		Q-1M	1	approx.4	approx.29
			2	approx.8	approx.58
		F-1M	1	approx.4	approx.25
			2	approx.8	approx.50
		F-2M	1	approx.2	approx.10
			2	approx.4	approx.20
AJ-P2C004HG	4 GB	Q-512k	1	approx.16	approx.68
			2	approx.32	approx.136
		Q-1M	1	approx.8	approx.59
			2	approx.16	approx.118
		F-1M	1	approx.8	approx.50
			2	approx.16	approx.100
		F-2M	1	approx.4	approx.21
			2	approx.8	approx.42
AJ-P2C008HG	8 GB	Q-512k	1	approx.32	approx.136
			2	approx.64	approx.272
		Q-1M	1	approx.16	approx.118
			2	approx.32	approx.236
		F-1M	1	approx.16	approx.100
			2	approx.32	approx.200
		F-2M	1	approx.8	approx.42
			2	approx.16	approx.84

Specifications (continued)

Card model number	Capacity	Recording bit rate (bps)	Number of cards	Recording time (hours)	Recording time of intermittent recording (hours)
AJ-P2C016RG	16 GB	Q-512k	1	approx.64	approx.292
			2	approx.128	approx.584
		Q-1M	1	approx.32	approx.243
			2	approx.64	approx.486
		F-1M	1	approx.32	approx.208
			2	approx.64	approx.416
		F-2M	1	approx.16	approx.87
			2	approx.32	approx.174
AJ-P2C032RG	32 GB	Q-512k	1	approx.128	approx.584
			2	approx.256	approx.1168
		Q-1M	1	approx.64	approx.486
			2	approx.128	approx.972
		F-1M	1	approx.64	approx.416
			2	approx.128	approx.832
		F-2M	1	approx.32	approx.174
			2	approx.64	approx.348

Notes:

- The recording time varies with image quality (movement and complexity). These are not guaranteed values.
- The recording time of intermittent recording is especially affected by image quality.

Specifications (continued)

■Video

Inputs:

CAMERA1 x 1
1.0 Vp-p, 75 Ω, unbalanced
CAMERA2 (Pin jack) x 1
1.0 Vp-p, 75 Ω, unbalanced

Output:

VIDEO OUT (Pin jack) x 1
1.0 Vp-p, 75 Ω, unbalanced

■Audio

Inputs:

AUDIO IN (Pin jack) x 2
–10 dBV, 47 kΩ, unbalanced
IN CAR MIC (Pin jack) x 1
–50 dBV, 3 kΩ, unbalanced
(plug-in power approx. 4 V)

Output:

AUDIO OUT (Pin jack) x 1
–6 dBV, 600 Ω, unbalanced

■DC IN connector

SIGNAL port

Input voltage L: ≦1.0 V
H: 8 V- 28 V
Input current: 1 mA (max.)

■Other I/O connectors

• GPIO/SERIAL connector
D-Subminiature 25-pin
RS-232C

GPIO
Inputs: 8 ports
Input voltage L: ≦1.0 V
H: 4 V- 28 V
Input current: 12 mA (max.)
Output: 1 port
(GPIO9 for Rec)
(open-emitter output)
Output voltage: 5.0 V
Output current: 15 mA
Time required to detect changes: 100 ms

• CAMERA1 connector
16-pin, for AG-CK10P

• CONTROL PANEL connector
10-pin, for AG-RCP30P

• LAN connector
RJ-45, connected to a PC application
100 BASE-TX/10 BASE-T

• GPS-ANT. (OPTION) connector
GT5 connector for GPS antenna (included in the separately sold AG-CR12P)

• USB connector
USB A connector for USB memory device
Compliant with USB Ver.1.1
Bus power current : 500 mA (max.)

Weight and dimensions are approximate.
Specifications are subject to change without notice.

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- Arbitrator Recorder Unit – 1 Year
- Arbitrator Remote Control Panel – 1 Year
- Arbitrator Wireless Receiver Unit – 1 Year
- Arbitrator P2 Card(s) (All Sizes) – 1 Year
- Arbitrator Wireless Microphone(s) / Transmitter – 90 Days
- Arbitrator System Component Interconnect Cables – 90 Days

Main Battery

The battery supplied with the product is covered under the warranty for one (1) year from date of purchase, except as excluded in Section 3. Batteries purchased separately are covered under the warranty for one (1) year from the date of purchase. A battery furnished under the warranty is covered for the remaining period of the one year warranty on the original or purchased battery.

Options and Accessories

The below listed Panasonic brand or supplied options and accessories are covered under this limited warranty for the period specified from the date of purchase or as specifically stated:

- AC Adapter / Power Cord – 3 Years
- Memory Card (Panasonic Brand) – 3 Years
- Car Mount Docking Station PCB or Complete Vehicle Docking Station – 3 Years
- Port Replicator / I-O Box – 3 Years
- Antenna Pass-through Cable – 3 Years
- Backlit or Full-sized keyboard - 3 Years or assumes warranty of the unit in which it is installed
- Integrated Panasonic supplied options and kits including, but not limited to Wireless Modems, Media Bay Drives (Floppy, CD, DVD, Combo), GPS, Bluetooth, Smartcard Reader, and Fingerprint readers – 3 Years or assumes warranty period of the unit in which it is installed provided the integration was performed by Panasonic or an Authorized Options Integrator
- Hard Drive (separately purchased) – 1 Year
- External USB Drives (CD / DVD / Floppy / Hard Drive) – 1 Year
- Optional Battery – 1 Year
- Battery Charger – 1 Year
- Standard or Digitizer Stylus Pens – 90 Days (physical damage excluded)

Section 2 - Limited Warranty - Software

Panasonic Computer Solutions Company (referred to as "Panasonic") warrants to you only that the disk(s) or other media on which the Programs are furnished will be free from defects in material and workmanship under normal use for a period of sixty (60) days from the date of delivery thereof to you, as evidenced by your purchase receipt.

This is the only warranty Panasonic makes to you. Panasonic does not warrant that the functions contained in the Programs will meet your requirements or that the operation of the Programs will be uninterrupted or error free. Panasonic shall have no obligation for any defects in the disk(s) or other media on which the Programs are furnished resulting from your storage thereof, or for defects that have been caused by operation of the disk(s) or other media.

Panasonic's entire liability and your exclusive remedy under this warranty shall be limited to the replacement, in the United States or other Panasonic designated location, of any defective disk or other media which is returned to Panasonic's Authorized Service Center, together with a copy of the purchase receipt, within the aforesaid warranty period. The customer is responsible for ensuring that all data is backed up and made secure during normal use and before sending a unit for service.

Section 3 - Limited Warranty Exclusions

Specifically excluded from the warranty are:

- All consumable items; such as screen protection films, logo badges, labels, cleaning cloths, carry cases, manuals, cables, straps, belts, holsters, tethers, and harnesses and any other options and accessories not listed above or covered under a separate warranty
- Failures related to the product operating system, hard drive image, software setup, software program, virus, other program(s) or file(s) on the hard drive or in any computer memory location
- Failures due to BIOS settings or changes, as well as any cosmetic or physical damage to the unit
- Any unit or device with a missing or altered model number or serial number label
- Damage which occurs in shipment
- Failures which are caused by products not supplied by Panasonic
- Failures which result from alteration, accident, misuse, introduction of liquid or other foreign matter into the unit, abuse, neglect, installation, maladjustment of consumer controls, improper maintenance or modification, use not in accordance with product use instructions
- Failures due to service by anyone other than a Panasonic Authorized Service Provider
- Failures caused by improper integration by any company other than Panasonic Configuration and Integration Centers
- Damage, failure, or loss due to the unit being stolen, lost, misplaced, or used by anyone other than the original purchaser
- Damage that is attributable to acts of God

This warranty only covers failures due to defects in materials or workmanship which occur during normal use.

Other Limits and Exclusions: There are no other express warranties except as listed above.

PANASONIC SHALL NOT BE LIABLE FOR LOSS OF DATA OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF THIS PRODUCT, OR ARISING OUT OF ANY BREACH OF THIS WARRANTY. ALL EXPRESS AND IMPLIED WARRANTIES, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED TO THE APPLICABLE WARRANTY PERIOD SET FORTH ABOVE. Some states do not allow the exclusion or limitation of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the above limitations or exclusions may not apply to you.

This limited warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

For technical support or to arrange for service on your Panasonic computer product, call our toll-free 24 hour hotline at 1-800-LAPTOP5.

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Panasonic Computer Solutions Company
50 Meadowlands Parkway, Panazip 2F-5,
Secaucus, NJ 07094

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